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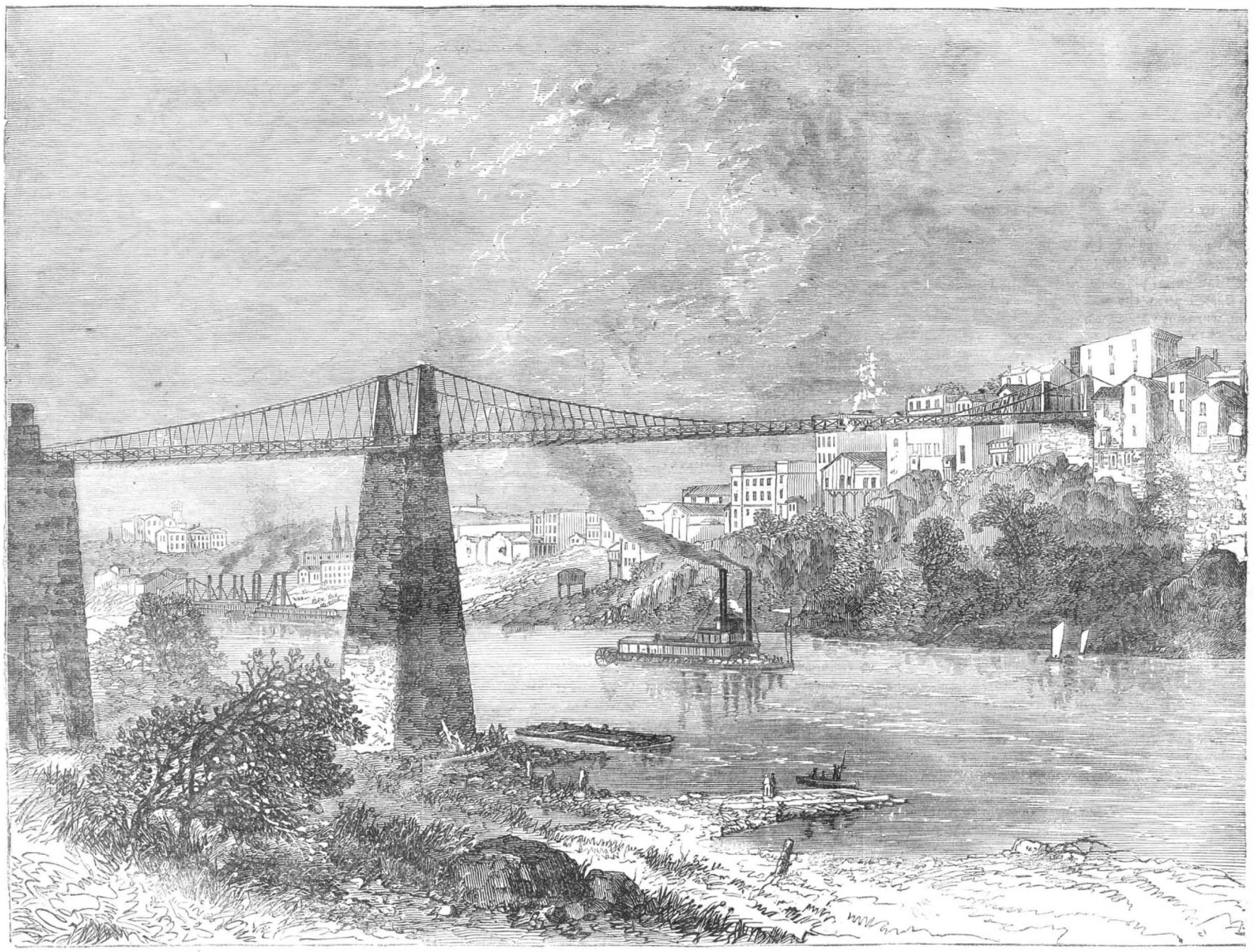
The Nashville Suspension Bridge.

The engraving gives an excellent view of the suspension bridge over the Cumberland River, Tennessee, connecting Nashville and Edgefield, built to replace the bridge destroyed by the confederate general, Floyd, when in possession of Fort Donelson. The floor of this bridge is about one hundred feet above low water mark. It has a carriage way with a foot-path on each side. Two cables, eight inches in diameter, support the structure, the span being six hundred and fifty feet and the roadway being twenty-eight feet two inches wide. At the north end it is slightly higher than at the other. It was built under the direction and superintendence of W. F. Foster, C. E., and is a work reflecting credit upon its constructor and the engineering and mechanical talent of the country.

Suspension bridges are of very remote origin. Kirchen, in his "China Illustrated" mentions one in China which according to tradition was built A. D. 65, and is now in existenoe. It is supported by chains, the roadway of plank resting directly upon them. Rope suspension bridges were used by the ancient Peruvians, and have been employed in Europe. The first iron suspension bridge in England was built 1819, across the Tweed at Berwick, by Sir Samuel Brown. It was constructed with chain cables, twelve of which were used. Its span was 449 feet and its versed sine 30 feet. The Brighton chain pier and the Montrose bridge were subsequently built by the same engineer. The former was destroyed by a gale in 1836. Its entire length was 1,136 feet in four openings, each of 255 feet span. The latter was built in 1829 and destroyed by a hurricane in 1838. The Menai bridge, built by Telford, was erected in 1826. Its span was 580 feet and hight of roadway above the water 102 feet. It was severely injured by a gale which produced so great an oscillation of the main chains as to dash them against each other and break off the bolt heads. The bridge was afterward repaired, and strengthened by additional braces.

One of the most beautiful suspension bridges in Europe is that of Freyburg, Switzerland; the cables are of wire and the span 870 feet. In this country the most remarkable specimens of this style of bridge are the Niagara with a span of 821 feet, the Wheeling with a span of 1,010 feet—blown down in 1854—and the one represented in the engraving. It would seem that the want of confidence generally expressed in suspension bridges is due rather to defects in their construction than to inherent faults of the system.



THE NEW SUSPENSION BRIDGE OVER THE CUMBERLAND, AT NASHVILLE, TENN.

EDITORIAL CORRESPONDENCE.

The Antiquities of Pisa—The Leaning Tower—Galileo—Florence as a City—Its Palaces, Paintings, Sculptures, Cathedrals, and Churches—Old Artists—A Visit to American Sculptors.

FLORENCE, Jan. 17, 1868.

The railway from Spezzia to Pisa passes for some distance near the base of the Carrara Mountains, from whence for centuries past has been furnished the amount of marble with which the cities of ancient Rome and modern Italy have been adorned and beautified. After a ride of three hours on this railway, we reached the old city of Pisa, standing upon an open plain, now a sort of imperial widow, mourning over buried hopes. At one period of its history, Pisa contained upward of one hundred and twenty thousand souls, and had considerable commerce; but to-day it is probable that there are not over twenty thousand permanent residents. Still, the old city has many monuments of antiquity, grand even in the solitude that surrounds them, which are well worthy a few hours' attention. I think it would be difficult to find in any other city in Europe, within an enclosure so comparatively small, four objects of greater interest than the Cathedral, Baptistery, Leaning Tower, and Campo Santo, of Pisa.

The Cathedral is a very extraordinary edifice in every respect, considering that it was built upwards of eight hundred years ago. The style of external architecture is quite novel, and original perhaps, with the architect, Buschetto, who had the reputation of being an original thinker, and creative, mechanical genius. A poetical inscription is preserved in the church, which declares that Buschetto once invented a machine whereby ten young maidens were enabled to raise weights that a thousand oxen could scarcely move, and by means of which a raft was transported to the sea, but, as the poet says, not without considerable difficulty. All traces of this wonderful invention, however, are lost. The interior is cheerful and exceedingly beautiful, having an elaborately gilded ceiling, precious marbles of variegated hues, porphyry columns, a fine pavement of mosaic, and pictures executed by some of Italy's greatest masters. The most interesting single object in the Cathedral is the old bronze lamp of Galileo, suspended from the ceiling. When but eighteen years of age, Galileo noticed its regular and synchronous vibrations, and it suggested to him the measure of time by the pendulum, a fact he afterwards improved by constructing a clock for astronomical purposes.

The famous Leaning Tower of Pisa was built about a century after the Cathedral, and though standing several feet from it, forms its campanile, or bell tower, and mounts seven bells, the largest of which is hung so as to constitute a sort of counterpoise to the line of inclination. The form of the Tower is that of a gigantic cylinder built of white marble, 179 feet high and 53 feet in circumference. On the outside are several tiers of marble pillarets, forming circular piazzas. Within the shell is a winding staircase leading to the top, where a very fine view is obtained, extending one way to Leghorn on the Mediterranean, and far inland on the other. The inclination of the tower is thirteen feet from the perpendicular, and on that account the ascent, otherwise easy, is liable to produce a disagreeable, sea-sick sensation, as at every turn of the spiral staircase one seems to be alternately going up and down. There is still considerable mystery as to the cause of this inclination. Some say it has settled since it was

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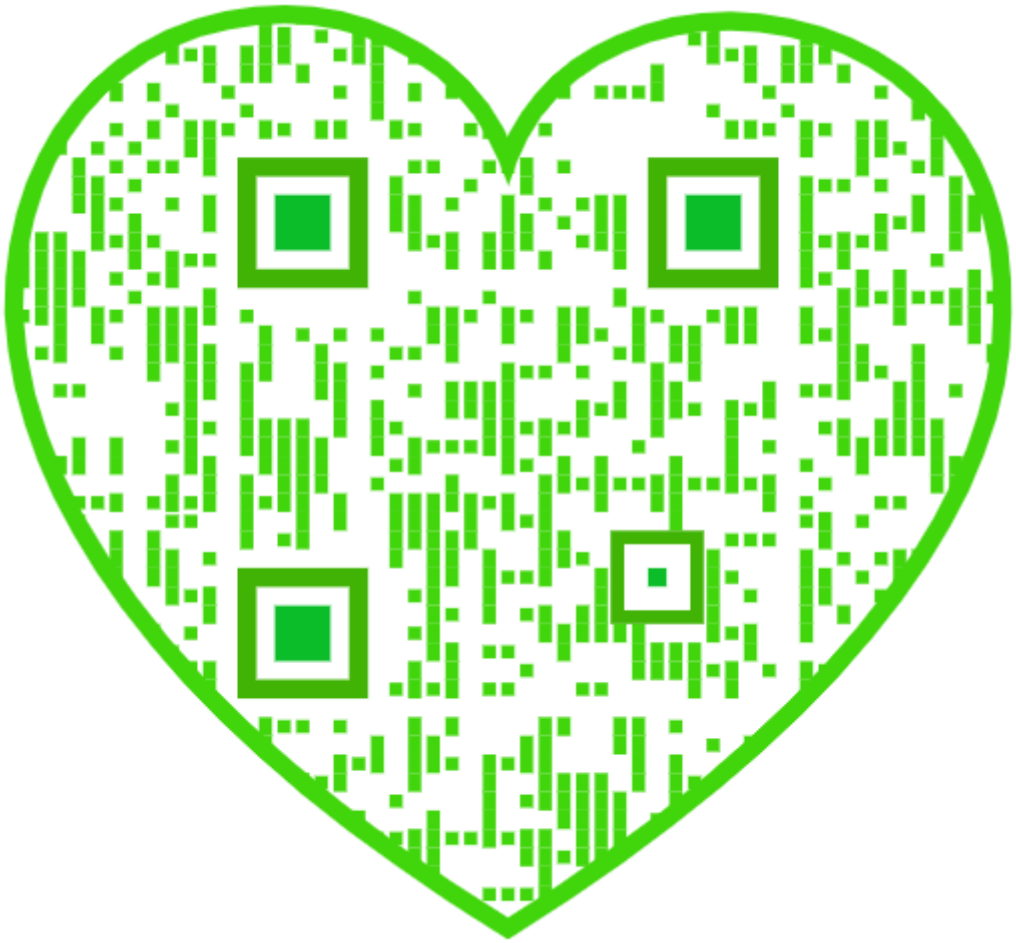

built, but there are no cracks any where visible in the structure to support this theory, therefore it is more reasonable to suppose from the present appearance of the Tower, which indicates an attempt to rectify it above the second story, that the foundations yielded soon after the structure was commenced, and that having settled as much as it could, the builders went forward and completed it. Under any circumstances the Tower is a singular edifice and would be worth seeing, even if it had been erected upon a plumb line. Galileo was once a professor in the University of Pisa, and his acute mind enabled him to make good use of the Tower to ascertain the measure of time, and to calculate the fall of heavy bodies. Many times, with instruments in hand, did he climb the winding staircase to pursue his profound studies, which so much perplexed and angered the doctors of the church, and thus it is that these old monuments of Pisa which now attract the notice of the curious, are also mementos of some of the grandest discoveries of science in Italy.

The Baptistery, a singular round edifice standing by itself in the open place, is one hundred feet in diameter within the walls, which are eight feet thick, surmounted by a fine dome, forming the frustrum of a pyramid. The interior is destitute of embellishment, but the marble font and pulpit are exquisite speciments of the art of carving, showing to what great perfection the art had advanced during the middle ages.

The Campo Santo forms one side of the area in which the Cathedral is situated, and may be regarded as a funereal museum of all ages and nations. It is a quadrangular-shaped structure, having extensive cloisters that open upon an interior court, covered with earth taken from the holy places of Jerusalem, and in the year 1228 brought to Pisa in fifty vessels, under direction of a prelate who was expelled from Palestine by the heathen. Within the cloisters are several fine monuments and slabs, which cover the remains of some of the most eminent men and women of Italy. There are also Pagan sarcophagi, which look somewhat odd in a consecrated Christian burial place. It appears from some very remarkable frescos upon the walls, that the Pisans, in those early time, were not very much afraid of the priests, if one may be allowed to judge from the manner in which the artist was permitted to bestow them after death. In the great fresco of the Last Judgment, the nude body of a priest is represented as being contended for by an angel on the one hand, and the prince of darkness on the other, while upon the left, among the outcasts, are seen the figures of kings, queens, cardinals, prelates, and other dignitaries of the church. The judgment, according to this picture, appears to have been rendered with strict impartiality, and without respect to rank or position—a fact which seems to accord with all scriptural testimony on that subject.

In passing from the Cathedral to the Tower, we saw a tall, masked figure, clothed in black, approaching rapidly toward us, holding a small box in his hand. The first impression made on our minds, upon seeing this novel, grotesque object, was that some black-friar had come up from one of the tombs of the Campo Santo, to warn us that our turn had come; but we were soon relieved of all apprehension upon being informed that it was simply one of the many ingenious methods adopted by religious associations for raising money. We were glad to get rid of the apparition by the bestowal of a small contribution.

Having indulged our curiosity for a few hours among the singular monuments of Pisa, we took the cars for Florence. The trip occupied a little less than three hours, and upon our arrival we found comfortable rooms awaiting us at Hotel de la Paix, which I mention by name simply to say that it is the best hotel we have yet found in Europe. We feel at home in Florence. It is one of those choice spots where the soul and body find a continual feast of good things, as upon every hand there are evidences of taste, culture, and good order, in marked contrast to the hubbub observable about the narrow streets and filthy docks of Genoa. We labor under the disagreeable necessity of seeing Italy in winter, which I regard as a misfortune, especially when the mind has accustomed itself to think of it only as a land of balmy air, cheerful sunshine, and glorious sunsets—a sort of second Paradise of fruits and flowers, history, poetry, song, painting, sculpture, and classic ruins, which charm away existence in grand dreams of romance. It has been unusually cold this winter in the south of Europe, and all this portion of Italy is clothed in a mantle of snow. One of the great charms of Italy is to see it in full bloom, to

> "Scent the new fragrance of the breathing rose,
> And quaff the pendant vintage as it grows,"

as we were permitted for a few days in summer to enjoy it about the Italian lakes. At such a time I am prepared to think that no other conntry in Europe can offer so much to interest and instruct the traveler.

Florence is a bright, well built, cheerful city—no dirt, no ruins, the streets usually wide, regular, and laid with flat paving blocks, such as we usually employ for sidewalks. The people appear calm, dignified, and orderly, with nothing either in dress, manners, or customs, to distinguish them from the French or English. An American on the streets of Florence is no more noticed than a Tuscan, and there is no peculiarity of physiognomy to stamp their nationality and mark them as a race. The public buildings and palaces are usually of the Tuscan order of architecture, with heavy stone fronts, rustic basements, severely simple, often imposing; though I must confess that with their small, heavily-grated windows, and unadorned fronts, they sometimes appear more like prisons than palaces.

Florence is divided by the river Arno, spanned by noble stone and suspension bridges; but the stream is small, and no other craft are seen upon its waters above the dam except small boats employed for carrying sand, scooped up from the river's bed for building purposes. There is also a fine, well-shaded park, called the "Cascine," a name applied to it because upon it is located the royal dairy, which furnishes milk and butter for the king's table. The fashionable drive extends for a long distance down the banks of the Arno, and if one can judge the wealth of a people from the style and number of equipages, I should say that the people of Florence enjoyed a full share of this world's prosperity. The environs of Florence are charming even in winter. The country is diversified with hill and valley, thickly studded with large villas, usually, however, of a mean style of architecture, snug little cottages, with surrounding grounds tastefully laid out, and well kept. In the season of flowers, when the orange blossoms, roses, verbenas, heliotropes, and carnations are in bloom, these suburban places must constitute a scene of great rural beauty.

The King Victor Emanuel resides in one wing of the famous Pitti Palace, a plain but imposing building on the outside, the inside containing some of the choicest treasures of the kingdom. We were admitted to view a suite of apartments fitted to receive one of the Princes, who was expected to occupy them the next day with his bride. All was regal, comfortable, and even homelike; but what pleased us most was a fine piece of sculpture by a young Florentine artist, which represents Michael Angelo as a mere boy in cap and apron, with mallet and chisel, intently at work carving a human face upon the surface of a block of marble. It is no ideal work, but the illustration of a fact in the boyhood of the great man, the ugly face now forming an object of interest in the gallery of sculpture.

The Pitti Palace is the offspring of a gentleman of Florence, who conceived the notion that he must do something to outrival a popular family of McFlimseys, that dwelt in another palace in a style which excited the envy of Pitti, who declared that he would have something so large and so grand that he could stow away the palace of his neighbor within the court yard. He succeeded well in his project so far as dimensions were concerned, but fell into disgrace before he could enter upon full realization of his vain pretensions, and now this grand palace is the abode of a king. On its upper floor is displayed one of the choicest collections of pictures to be found in Europe. On the opposite side of the Arno from where the Pitti Palace stands, is the famous Uffizzi, another of those immense palaces so common in Italy, this one having been built by Cosmo de Medici, a name intimately associated with the earlier history and fame of Tuscany. He bore the title of "Father of his Country." The two palaces are connected by a long covered passage, extending across the river, a distance of more than one-fourth of a mile, and lined on either side by tapestries, historical pictures, and, more interesting still, a fine collection of the studies of the famous old Italian painters. At one time this covered way was only used by the occupants of the palaces; but now it is thrown open to the public as an easy means of communication between the two buildings.

The spacious upper rooms of the Uffizzi are used for paintings and sculpture, the whole forming one of the richest and most varied collections in the world. Apart, however, from the statuary and antiquities, which are very rich, the collection of pictures, as a whole, is inferior to the famous Madrid gallery, of which I spoke in one of my letters from Spain. The pictures of the Pitti and Uffizi comprise some of the master works of Raphael, Andrea del Sarto, Perugino Carlo Dolce, Titian, Reubens, Correggio, Van Dyke, Michael Angelo, Salvator Rosa, De Vinci, Dominichino, and others of the dead generations of great painters of the Italian and Flemish schools, whose works living artists vainly attempt to reproduce, for of living original painters the Italy of to day is almost equally poor with old Spain. I think it may be said with truth, that Germany is the only country on the continent where the art of painting flourishes with any considerable boldness and originality, and the seat of this department of fine arts has been transferred from Rome and Florence to Munich, a city that contains more resident artists than any other in Europe. Italy is still the repository of ancient and modern sculpture. In this higher and nobler art, Florence and Rome hold undisputed supremacy, not, however, in their native artists, for it is with some degree of pride that I can speak of our own Powers, Crawford, Rogers, Ball, Hart, Hosmer, Story, and Mead, as among the very first sculptors in the world. The Uffizi contains the celebrated Venus de Medici, The Apollo, The Slave Whetting his Knife, The Dancing Faun, and The Wrestlers, while here, as in other places about Florence, the works of Cellini, John of Bologna, and Michael Angelo, sculptor, painter, and architect, make this fair, clean city a central spot of noble, exquisite skill in this department of the fine arts. Michael Angelo was a native of Florence, and the old house where he lived is now shown to visitors as one of the sights of the city. With his right hand he could chisel a David, with his left hand he could paint The Fates, and with both, when combined with his extraordinary fertility of genius, he could plan St. Peters, the grandest architectural structure in the world.

I have said that Florence had no ruins of fallen greatness, but it has very ancient buildings, some of which would have gone to decay centuries ago but for the frugal care of its people. The city is especially rich in the number and magnificence of its Christian edifices, the first and foremost being, of course, its noble cathedral, the most impressive, externally, I have yet seen, and possessing the rare advantage of standing by itself, and not encumbered, like many other similar edifices in Europe, by mean shops and market stalls, to destroy its symetry and effect. The exterior is a grand mosaic composed of different colored marbles, which imparts to it a novel and very singular effect. The interior is in the form of the Latin cross, cold, severe, and lofty, surmounted by a central dome which impresses the mind with awe. This dome measures 138 feet in diameter, and mounts upward 133 feet above the cornice, and is said to have furnished Michael Angelo with his idea of the dome of St. Peter, which is several feet higher, but of less circumference than this great original. On Sunday morning we attended high mass at the cathedral. The service was conducted by upwards of two hundred priests and boys, who occupied a chapel in one of the transepts, shut off from the main body of the church by a high wood and glass partition.

The attendance upon the service, which was conducted with great dignity, was comparatively small, but neither here nor elsewhere in Italy have I seen anything of that degrading superstition which I noticed everywhere in Spain. The baptistery of the cathedral, like the one at Pisa, stands by itself. Its exterior is of black and white marble, but the interior is richly ornamented by sculpture, mosaic, and frescoes. In accordance with an ancient ritual, all the baptisms of the city are performed here, and at the time of our visit several were being presented by their loving mothers to receive the baptismal water, which, after a simple service performed in each case, is poured over the little one's head from a small silver cup. About a dozen baptisms are performed each day, the females, according to the records, outnumbering the males thirteen in every one hundred.

The Campanile or bell tower is a square isolated pile of black and white marble, 275 feet high, and intended by its architect to reach a higher altitude than any structure ever raised by Greek or Roman, and yet it is not so high as the grand dome of the cathedral which stands near it. Upon the lower panels are several sculptured bas-reliefs of a scriptural character, the whole forming one of the most singular looking yet graceful structures ever erected.

I have only space to speak of one other church in Florence, which is perhaps the most interesting one to be found in the city. I refer to the Santa Croce, filled with illustrious tombs and justly styled the Pantheon of Florence. The religious character of the edifice is almost lost in its national character. Michael Angelo is buried here, though he died in Rome. The Pope directed that his body should be buried at St. Peter's, but Cosmo de Medici, jealous of such an honor, had it secretly removed at night in a box of merchandise. His marble monument, though somewhat deficient in grandeur, is nevertheless a fine work. Galileo's tomb stands opposite to Angelo's. He died at the age of 78 years, and is said to have entered the world the very day and hour that Angelo left it. The monument is a fine one, and was erected as an affectionate memorial to a great genius and persecuted man, by the heirs of his favorite pupil, Viviani, but nearly a hundred years after Galileo's death, and when permission was given by Clement XII. to have his bones removed to this church. Here are also the tombs of Dante, Machiavelli, Alfieri, Aretino, Lanzi, and many other great men who have honored art, science, and literature.

The Museum of Natural History, among other wonders, contains the finest collection of anatomical preparations to be found in Europe. They exhibit every portion of the human body with astonishing skill and fidelity, from the earliest form of animal life to the last stage of decomposition. Here is also to be seen, within a beautiful court fitted up at great expense, the "Temple of Galileo," which contains a collection of his manuscripts and inventions, including the telescope with which he discovered the satellites of Jupiter, and the old astronomical clock made at Pisa. The room is railed off to keep persons from getting near to the cases, from fear that some of these old treasures might inadvertently slip away. I got permission from the director to go inside, but the collection of objects was so numerous and the place so cloudy at the time that I could not examine them with any care. The walls of this little temple are beautifully inlaid with marble and jasper, and the ceilings are richly frescoed, illustrative of the principal events in the life of Galileo.

I spent one delightful day in visiting the studios of our American sculptors. Powers has in hand several busts, also an ideal piece which is intended to represent the "Last of the Tribes," a memorial of the expiring races of Indians in our country. The female figure, already in plaster, is exceedingly beautiful, and with the accessories of the kirtle, the moccasins, and other simple appendages to be added, I feel warranted in saying that when finished it will be worthy the skill of the great artist whose fame belongs to our own country.

Hart has just finished a bust of General Jackson, one of the finest heads I have ever seen. It was modeled in 1839 at the Hermitage, during the last days of the old hero, but his death following soon afterward, the family took no interest in the work, and its completion was delayed. The marble is beautiful, the chiseling perfect, the face magnificent. It is worthy of a good place in our country. He has also in hand an ideal group of rare force and beauty, entitled "Woman's Triumph." The female figure is life size, standing upon the right foot, the left being partially lifted, the head bending gracefully down to look at a little Cupid who has exhausted his last arrow upon the object of his attention, the arrow being held upward in the hand of the woman, who seems to say, with a firm tenderness, "I am to be wooed and won, but not assailed." It promises to be a charming work of art.

Ball, who is a very careful, painstaking sculptor, is working some fine busts; he has also an ideal subject in hand, intended to represent our mother Eve at the moment of her creation. The figure, very gracefully posed, is the embodiment of innocence and surprise—when the first thoughts of the world are breaking upon her senses—there is remarkable simplicity and sweetness in the face and the whole attitude is well conceived and expressed. It was ordered by a wealthy

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New Yorker since deceased, whose family no doubt would prefer to have the figure possessed by some other party. Whoever gets it will have "a thing of beauty," which is said to be "a joy forever."

Mead, an industrious artist whose group of marbles exhibited in New York some two years since gave him a good name, has a great deal of work in hand, having received an order from the government to carve some caps to ornament the pilasters for a room in the Treasury at Washington. This work however, is being done under Mead's direction by skillful Italian artists. The chief work in his studio is a fine group for Legrand Lockwood, representing Columbus' Last Appeal to Queen Isabella. The queen is attended by her page, and the group is intended to represent the moment when Isabella has decided to further the project of Columbus. She says: "I will assume the undertaking for my own crown of Castile, and am ready to pawn my jewels to defray the expense, if the funds in the treasury shall be found wanting." It is a grand life-size composition, and will require from three to four years to complete. Meade is also designing a Lincoln monument for Springfield, Ill.

I have already extended this letter beyond the limit intended, but the subjects have grown in number and interest as I have progressed, therefore I will stop just here.

S. H. W.

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

The Carboniferous Formation of Mississippi.

MESSRS. EDITORS:—None of the formations of this State are of so much national importance as the carboniferous and the miocene overlying it.

1st. Its building, mill stone, and grind stone are found in various places in Tishemingo county; fine grained, compact, resisting disintegration, and of the required thickness, easily quarried, and convenient to navigation.

2d. Very fine carbonate of lime, along the Memphis and Charleston Railroad, Big Bear Creek, and Tennessee river.

3d. Aluminous limestone in great abundance and of excel lent quality, easily quarried, accessible, and unsurpassed for making hydraulic cement, which is an article of extensive consumption in all the States, for lining cisterns, cellars, cementing culverts, walls, bridges, pillars, etc. It is found near the Tennessee river, in the northeastern corner of the State, in cliffs of fifty feet in hight, and bordering on the southern banks for miles. It is perhaps the largest accessible deposit in the Southern States, and of a quality unequalled. The cement made of it sets almost as rapidly as plaster of Paris, and becomes very hard under water. Analysis: Insoluble matter, 54 201; potash, 0.478; lime, 23,247; magnesia, 0.788; peroxide of iron, 0.903; alumina, 1.064; phospheric acid (a trace); carbonic acid, 15 572; organic matter, water, and loss, 3.750=100 parts. The location is within seven miles of the Memphis and Charleston railroad, as well as on the river, and I have no doubt it will be found much nearer. The demand is very great, and is annually increasing; the long transportation from the Northern States renders it very burdensome to the Southern consumers. If this immense deposit was fully developed, and only a tithe of it manufactured, it would add many millions to our national wealth, as well as enrich the company that first presented it to the public. It is a mine more valuable than silver or gold, the quantity is inexhaustible, the quality is unsurpassed.

4th. Terra Sigibbatta, or red ochre, is found six miles from Iuka and two miles from the river, in such quantities and so easy of access, as to render it very profitable. The stratum has a visible thickness of fifteen feet, forming the bank of a rivulet; and is overlaid like the white clay found in its vicinity and elsewhere, by strata of ferruginous, conglomerated pebbles. It has a dull, red color, resembling burnt sienna; is indistinctly stratified, cleaves into irregular, massive fragments, is smooth, oily to the touch, and readily polished, writes readily on wood or paper, is easily cut into pencils, slightly effervesces when mixed with water, dissolves readily, and adheres with much tenacity when applied as paint, without any addition of oil and is believed to be as durable as white lead. When kneaded, it forms a plastic mass, susceptible of manipulation by the lathe, and could be readily made into crucibles and other earthern ware. When mixed for paint, with either water or oil, the compound is so smooth and perfectly uniform that the eye cannot detect the smallest particle of coarse ingredients, even on a white surface, and when nothing but a wooden pestle has been used. The color is a reddish brown, and by the admixture of lampblack could not be distinguished from burnt sienna, an article very extensively sold. An immense fortune, at a very small outlay, could be made by a man of energy and experience. The mixture does not easily fuse, but is quite refractory. The deposit is extensive.

5th. Kaolin. The most extensive bed of this highly practical deposit, in the known world, is found in Tishemingo county, near Iuka. It is thirty-two miles long, from two to three miles wide, and is in some places twenty feet deep. It is soft, fine, friable, resembling starch, and is of various colors. Kaolin mines in Europe belong to the government, and are considered more valuable than gold and silver mines. The most valuable are found in Saxony, and are there made into fine porcelain ware. A set of this porcelain, valued at $55,500, was presented to the Duke of Wellington by the King of Prussia, in 1816. The profits of the mines are immense. The porcelain mines of England are not so valuable, though 60,000 workmen are engaged at Staffordshire. A porcelain manufactory in Tishemingo would be a national ing employment to thousands, in the healthiest county in the United States, according to the census of 1850 All kinds of queensware, pipes, artificial teeth, etc., could be manufactured from this deposit. Fire brick, too, could be made at a great profit, say $30 per 1000; since $10 would make them, $10 take them to market, where they bring $50.

6th. Silica, is perhaps the most profitable deposit in the State. It is abundant, of fine quality, and within a mile of uninterrupted navigation, in the midst of any quantity of fuel, and very accessible. It is almost as pure as quartz itself, containing about 98 per cent of silica. Nearly all the English glass manufactories obtain their silica from Lynn and Ryegate. The Pittsburg glass houses send to Missouri for their silica. A better material for the finest kinds of flint and crown glass, is not known anywhere. Bohemian crown glass is an article of commerce throughout the civilized world, and very profitable. There is no glass factory in the Southern States. The deposit is six feet deep, and forms the base of a large hill, containing silica enough to supply America for a thousand years. Water-glass, or silicate of soda, is much used for an enamel, or varnish upon plastered walls, and could be very extensively used in making fire-proof wood, cloth, and paper.

These six minerals are all found within a few miles of each other, and are all abundant, accessible, surrounded by fuel and other requisites, located on lands that can be bought for five dollars an acre, or less, in the midst of well-watered, pine-clad hills, and the healthiest district of America; thus affording rare inducements to emigrants, capitalists, philanthropists, and state and national companies.

Iuka, Miss. J. M. D. MILLER.

Heating and Ventilating Railroad Cars.

MESSRS. EDITORS:—Since that terrible railroad accident, by which forty or more persons were burned to death, the attention of the public has been very properly drawn to the subject of devising some mode of heating cars which will obviate the danger we are all exposed to in traveling, under the present method of warming them by stoves. Allow me to submit the following suggestions on the subject:

I would have the cars constructed with double floors, with a space say of from six to nine inches between them, and in this space place lead pipes for the conducting of steam and the radiation of heat, with openings in the sides of this space for the admission of cold air, and registers in the upper floor to allow the heated air to pass into the cars. I would have a heating car to be run in the rear of the train. This car should be large enough to contain the boiler and fuel, and room for a man to attend to it. It should be built of white oak timber six inches thick, and lined with boiler iron. The boiler should be made in the strongest manner, and well secured to the floor of the car. The steam could be conducted to the passenger cars by metal pipes,

the cars made of some elastic material, like gutta percha, or sole leather. The advantages from this plan would be—

1st. Entire safety from fire in case of accident.

2d. The floors of the cars would be always warm, thus ensuring warm feet.

3d. The heat would be of the pleasantest and most healthful kind, and thoroughly distributed in the cars.

4th. In connection with ventilators near the top of the car, the most perfect system of ventilation would be established, as there would be constant streams of warm air coming in, and displacing that already in the car.

The first cost of this mode of heating would be somewhat more than the present method, but when we take into consideration the destruction of cars by fire, it is doubtful if it would cost more in the end: but supposing it did, who would not be willing to pay something more for transportation for the advantages above enumerated? Indeed, in point of economy, we could well afford to pay for the extra cost, as we should save much more than that in the time and money now lost by sickness, occasioned by cold feet and bad air, incident to the present mode of heating cars, and the total want of ventilation which now prevails.

The public demand a total change in the whole system of warming and ventilating passenger cars, and the first of our great lines, from the east to the west, that meets this want, will be much more than compensated for the cost by the patronage of the traveling community. P.

Milwaukee, Wis.

Steam Expansion.

MESSRS. EDITORS:—In your issue of January 25th there appeared a communication under the above title from your Buffalo correspondent, Mr. Sisson. It appears that a new light is dawning upon the engineering world, which is calculated to dissipate old errors, to cause theories accepted by such authorities as Watt, Mariotte, Gay Lussac, Biot, and a host of other savans to vanish into thin air and before which such celebrities as Fulton, Ericsson, Bourne, Isherwood, and Dickerson, dwindle into insignificance. But let us look for a moment at some of Mr. S's assertions. First, he says, "the expansion of steam is in proportion to its temperature above 212° heat." Now if we understand Mr. S. steam must have a temperature of 2×212=424° before it can expand to twice its original volume. The pressure of steam at 424° is according to the experiments of the French Academy, 315 pounds per square inch. It follows therefore that, in order to cut off steam at half stroke, and maintain a pressure on the steam side of the piston throughout the stroke, the initial pressure of the steam must be 315 pounds per square inch.

Has Mr S. ever seen steam used in an engine at that presssure

It is a well known fact, of every day occurence for more than a third of a century that steam engines are run with pressures considerably below 100 pounds, cutting off at one-eighth to one-tenth of the stroke and the "indicator" shows that steam pressure is maintained to the end of the stroke, in other words, that a vacuum is not formed.

If Mr. S's assertion be true, steam cut off at one-tenth of the stroke, and maintaining a pressure throughout the stroke, must have a temperature at least equal to 10×212=2120°, or about the welding heat of iron. The pressure corresponding to this temperature has never yet been, nor is it likely that it will ever be ascertained. The experiments of the French Academy extended up to 510°, and the corresponding pressure was found to be 750 pounds per square inch. The increase of temperature between the pressure of 675 and 750 pounds being only about 11°. If we suppose now for the purpose of comparison that the increase of pressure and temperature above 750 pounds be proportional (it is not however) to the increase between 675 and 750 pounds we shall find that the pressure corresponding to 2120° will be about 4300 pounds. per square inch. Does S. perceive the utter absurdity of his assertions?

Second, S. says "steam cannot exist in a temperature below 212°." Any school boy of average attainments, can tell Mr. S that he has seen water boil in the exhausted receiver of an air pump at a temperature very much below 212°. Now if water boils under such conditions steam must be formed and must therefore exist at a temperature below 212°.

Third, S. says, "I affirm that steam of 75 pounds of pressure cannot expand to twice its bulk without going below 212° heat."

Steam of 75 pounds expanded to twice its bulk will exert a pressure of 37½ pounds. This result is in accordance with Mariotte's law and its truth having been abundantly established by experiment, no longer admits of a doubt. But steam of 37½ pounds has a temperature, also determined experimentally of 285°, instead of 152° as stated by Mr. Sisson.

Fourth, Mr. S. says "The temperature which corresponds to 75 pounds of steam is about 304°, expand this temperature to double its *bulk* etc., etc." We never before heard of expanding a *temperature*. JOHN L. LAY.

Buffalo, N. Y.

Oil of Steel.---New Plan of Welding.

MESSRS. EDITORS: Is there such an article as *Oil of Steel* (!) or any thing by which a bar of iron or steel broken short off can be welded together without hammering. I understand there is some substance used in welding band saws when broken.

There is in the shop where I work an iron vise, the screw of which was once broken and stuck together again by a blacksmith without injuring the thread of the screw. It has been in use fifteen years since and still holds. If you can inform me how it is done do so and oblige, G. H. A.

[We have heard of "oil of birch" and "oil of strap", both said to be useful in sticking a boy and his work together, but "oil of steel" greets our ears with an unfamiliar sound. We know of no substance with which "iron or steel broken short off can be welded together without hammering"—which, of course, comprehends heating. The brazing of a broken vise screw is too common to make any special note of.

But that there is a way of uniting two pieces of steel which have been broken apart we firmly believe; for, although we never witnessed the operation, we have seen its results. Some years ago we carried on the machine making business in Nova Scotia, and heard of a "Frenchman"—as the descendants of the Norman colonists of Acadie were called—who mended broken scissors and knife blades, augers, etc re-uniting the two pieces without brazing or welding. Several specimens of his handiwork came under our notice, but, to be assured of the fact, we made a test in giving him a broken penknife blade to repair. He completed the job in his shop in fifteen minutes while we waited in his house. The mark of fracture was just visible on the blade but no evidence of heat sufficient for brazing. The blade did satisfactory duty for several months, when the knife was unfortunately lost. Truly our knowledge of that mysterious product, steel, is limited, and there is much yet to be learned as to its treatment.—EDS.

The Scuppernong Grape.

MESSRS. EDITORS:—This grape, the grape of the Southern States, is destined to revolutionize grape growing and wine making in America. It has no equal, much less a superior, in productiveness or quality. It never rots, never mildews, never fails to bear immense crops. A vine will live for a hundred years, bearing yearly, after ten years of age, from twenty to fifty bushels of grapes, yielding from fifty to one hundred and twenty gallons of wine. It needs no training, no pruning, no trellising. It is emphatically the poor man's friend. There are three varieties, the white, black, and golden-hued, each making an excellent wine, but of a different color. Dr. Jackson, the celebrated chemist of Boston, says, "Scuppernong wine can be made so fine as to excel all others made on this continent." It is sweet, rich, juicy, and luscious, and has no superior as a dessert grape; bears carriage, and keeps well. It will grow anywhere South where corn or cotton will flourish. It has never been tested in the North. It is the grape of all grapes, possessing more good qualities and less imperfections than all others combined.

Iuka. Miss. J. M. D. MILLER.

THE momentum of an ancient battering ram of 180 feet in length and 28 inches in diameter, armed with an iron head weighing a tun and a half, and moved by the united strength of a hundred men, was equal to the momentum of a 36 lbs. shot discharged point blank. benefit, giv-

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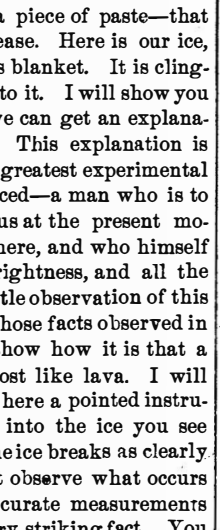
HEAT AND COLD.

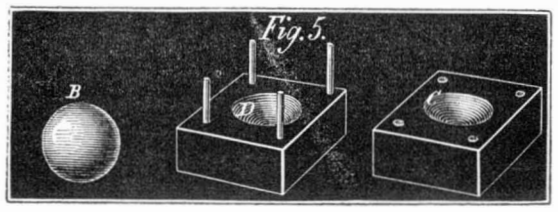
BY JOHN TYNDALL, ESQ., LL. D, FRS.

Lecture III.--Continued.

I want to show you now how it is that ice can behave like treacle, or honey, or tar—how it is that it behaves like lava, or paste, or a viscous body. In order to make this plain I have asked Mr. Cottrell to bring me in a mass of ice; and I hope to be able to show you by experiments in this room that we can make ice behave almost like a piece of paste—that we can mould it into any form we please. Here is our ice, and we will place it on the table in this blanket. It is clinging to the blanket, being, in fact, frozen to it. I will show you how, from an apparently little thing, we can get an explanation of a fact observed in the glaciers. This explanation is due to a little fact first observed by the greatest experimental philosopher that this world ever produced—a man who is to my feeling almost living here among us at the present moment, a man who lectured to the boys here, and who himself had all the tenderness, and all the brightness, and all the joyousness of a boy. I say it is by a little observation of this great man that we are able to explain those facts observed in connection with the glaciers, and to show how it is that a body so brittle as ice can behave almost like lava. I will show you the brittleness of ice. I have here a pointed instrument, a small awl, and if I prick this into the ice you see that it chips off little pieces, and that the ice breaks as clearly as any crystal would break. Now just observe what occurs among these glaciers. If we make accurate measurements upon this *mer de glace* we ascertain a very striking fact. You see in the diagram a great white glacier. Here you see another, and you see another there. I measured the width of the first glacier, and it was 1,134 yards. The second glacier is 825 yards; and the third 638 yards. If you add these together, the sum of the widths of these three tributaries of the Mer de Glace is 2,597 yards. Now, all of these three tributaries of the Mer de glace are squeezed into a space, which measures only 893 yards, a channel only one-third of the width of the sum of the three tributaries. Now it is one of the wonderful properties of this ice that it can be thus squeezed into a narrow bed. If we take a number of stakes and set them in a perfectly straight line across this channel, and allow them to remain there for a day, and observe their position on the following day, we shall find that they are no longer in a straight line. In the observation that was made there were no fewer than 16 stakes fixed in the ice in a straight line. The stakes nearest one side of the glacier moved at the rate of 7 inches in a day; the next stake moved at the rate of 8 inches—the next 13 inches—the next 15 inches—the next 19 inches, and the next 20 inches; and then the speed began to fall off, and fell back to 15 inches at the other side of the glacier. These numbers prove a fact which is also observed in the case of rivers—that the middle of the line moves more quickly than the sides. In the same way, as was proved by Principal Forbes, the top of the glacier moves more quickly than the bottom, or the part nearest its bed, which is held back by the friction of the bed. When I visited the Mer de Glace in 1857 there was a precipice of ice, and I measured the motion of that precipice at the top and at the bottom. The top stake moved 6 inches, while the middle stake moved 4½ inches, and the bottom stake moved 2½ inches. This shows that the top of the glacier moved more quickly than its foot. Furthermore and—this is a point of great importance—if you had a river flowing through a straight valley, the middle of the river would be its point of quickest motion; but if you had a river flowing through a valley of this kind (Fig. 4) the point of quickest motion would be always at the point where it is curved. It is exactly the same with a glacier. This on a large scale will represent the bed of the Mer de Glace from actual measurement. At the parts, A A, the point of swiftest motion is really the center of the glacier. Here, again, at *a* and *c*, the point of swiftest motion is on one side of the center. Here, again, at *b*, it crosses to the other side of the center. The dotted line is the center, and the continuous line marks the points of the quickest motion on the Mer de Glace.

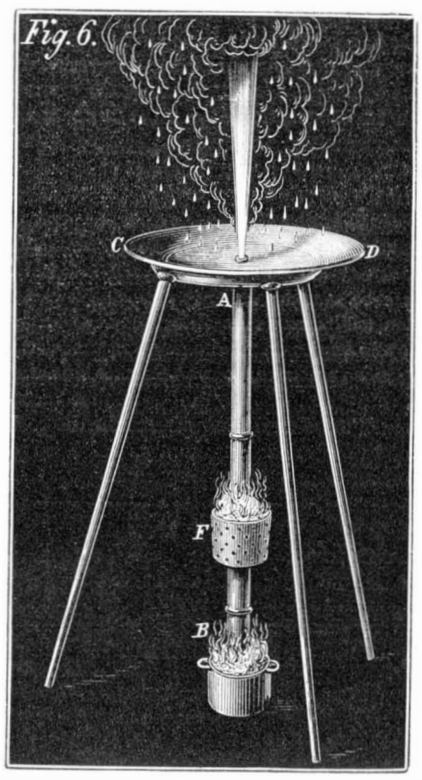


Now, how is it that a glacier is thus able to behave as a river? We will see. I will now cut two pieces from this block of ice. We see that the ice is now melting in the atmosphere of this room, and there is no surplus cold in it to enable it to freeze again; and still, strange to say, (and this was the observation that Mr. Faraday made), if we place those pieces of ice together, though the surfaces are now melting, they instantly freeze together. Although there is no surplus cold in the ice, the mere bringing them together causes the film of water, which a moment ago was moisture, to become ice. This curious freezing together has received the name of "regelation," a term for which those who first worked at the subject were indebted to Dr. Hooker. In consequence of this freezing together you can actually convert snow into ice. Every boy knows the state of snow which is fit for a snowball. It ought to be soft, and yet by proper pressure you can make it perfectly hard if you are wickedly inclined. Now, I have no snow here, but I will try and obtain snow by scraping the surface of the ice. In this way I get a kind of snow, and here is a flannel in which to receive it. I will take this snow and put it into a proper mold C D, and squeeze it together. In the absence of real snow I make the snow required for the experiment by crumbling the ice in this way. I will now make a snowball, and I am enabled to do this by the power which the small particles of ice have of freezing together in the manner I have just indicated. I cannot by my hand squeeze strongly enough the mold containing these particles

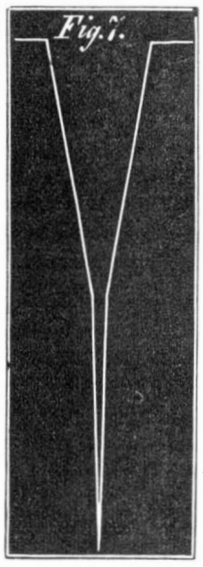


of scraped ice; and therefore I will place the mold under the hydraulic press, as this machine is called. In this way I hope to obtain a snowball. [The operation described was then performed, and the mold, on being withdrawn from the press, was found to contain a ball of solid ice.] Now, here we have a snowball (B), such as you have never seen before, and this is due to the fact that on bringing the surfaces of the little particles of ice in contact they freeze together. This is not an ordinary snowball at all, and it is one which no boy would like to be hit with. It is a ball of solid ice, produced from the small particles which have frozen together in virtue of this property that ice on the surface of water, though shattered into pieces, will mend itself; and all the tearings and ruptures of the glaciers are mended by means of this quality of regelation which was discovered by Mr. Faraday. I have here several experiments arranged to illustrate this subject. [Particles of scraped ice were then molded into the form of rings and hemispherical cups, by the same means as had been employed in the production of the solid ball. Two hemispherical cups were afterwards placed with their edges in contact, when they froze together and formed a hollow sphere of ice.] These experiments will show you on a small scale how possible it is for particles of a substance perfectly brittle to freeze together wherever they touch, on account of the substance possessing the power of regelation. You see that a substance of this character behaves as if it were not brittle at all, and acts like a paste. In this way we might make statuettes, or, in fact, mold the ice into any form we pleased. You might drink out of these cups, and the ice of which they are made would cool the water for you. I am sorry I have not a little cooled wine to offer you from a cup of this kind. (Laughter.) I have made champagne glasses and all manner of things by thus compressing ice. In this way by these small experiments we illustrate and make plain to ourselves those wonderful things that go on among the glaciers of the Alps; and we entirely clear up the difficulty as to how it is that a body so brittle as ice can behave as a viscous body. I must now leave this subject of ice and its properties.

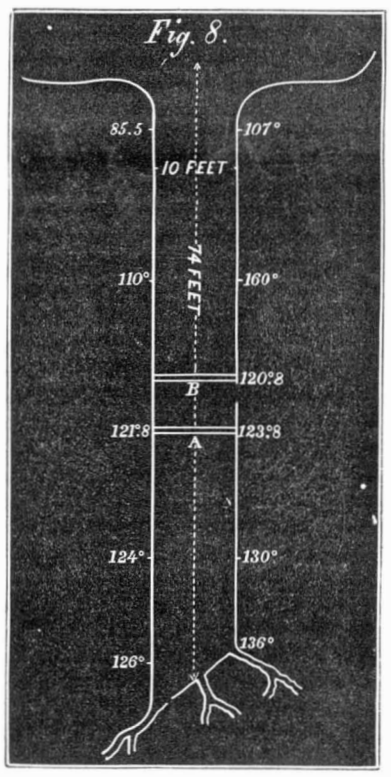
There is in operation before you an apparatus for illustrating the action of the geysers in Iceland; and in the other room is a beautiful painting of the geysers, presented by our president, Sir Henry Holland, who was there in 1810 with Sir George Mackenzie. In a short time this tube will throw out a column of water, but I do not think I shall be able to make the operation plain to you in this lecture. When Sir



Henry Holland and Sir George Mackenzie visited the great geyser, Sir George Mackenzie supposed that the geyser had underneath it a great cavern, and that this was partly filled with water, the geyser itself being a tube. He supposed the water to become heated beneath, and the steam to force the water up into the tube. This is the theory given by Sir George Mackenzie; but it is not at all necessary to suppose the existence of this cavern. The spring itself has built its own tube, and the tube is a sufficient apparatus to produce these wonderful eruptions that astonish everybody who has ever seen them. The geyser tube is represented here in section (see Fig. 8). It is seventy-four feet deep, and is lined with a most beautiful plaster. It opens out at the top into a basin fifty-two feet wide in one direction, and sixty feet wide in the other. [The apparatus for illustrating the geyser was then put in action, and a thick stream of boiling water was presently ejected upward. (See Fig. 6).] Now, I must make another eruption for you. I want to produce an imitation of



the spring called the strokkur (shown in section at Fig. 7). This is a very celebrated spring which you see in Sir Henry Holland's painting beside the real geyser. (I must explain in the next lecture how it is that we have two fires in this apparatus.) It is usual for the natives of Iceland to stop the mouth of the strokkur by throwing in clods. I will now imitate that practice by putting in a cork at the end of the tube. In a short time the cork will be ejected, and I should not be at all surprised if the water reached the ceiling. I think the last experiment made at the strokkur was made by Commander Forbes. He wrapped a leg of mutton in a towel and stopped the mouth of the strokkur by means of that leg of mutton. The leg of mutton came out well cooked, and was projected to a great hight in the air. Various people have estimated the hight of these eruptions in Iceland. Sir Henry Holland tells me that he saw one of more than one hundred feet; and Sir George Mackenzie gives ninety feet as the hight of the eruption. The earlier observers made the hight very much more. Two Danes, named Aulafsen and Paulson, who were the first to observe the hight, state that the geyser pitched its water to a hight of 360 feet. Two observations, which may be regarded as perfectly trustworthy, were made by Bunsen, of Heidelburg, and the hight was measured by a theodolite. In the last of these observations, which was made on the 16th of July, 1841, the hight was estimated at 162 feet, and we may rely upon this observation as being accurate. Now, as I have said, the tube of the geyser is the cause of the eruption; and when we see an eruption produced by a small tube, as in this model, we may regard it as proved that it alone is a sufficient cause, and that there is no need for the supposition that there is a cavern underneath. Bunsen suspended thermometers at various depths below the basin of the geyser to ascertain the temperature of the water. I have marked on this diagram the various temperatures



which he found at different depths. At the top the temperature was 8·45° C., and extended to 126·5° C., as the depth increased. Now, how is it that the water does not boil in the geyser when the temperature is over 100° C.? Every boy here will be able to tell me that it is because the water at that depth has to bear not only the pressure of the atmosphere, but also of the mass of water which is above it in the tube. For this reason it cannot boil at the temperature which Bunsen ascertained. At the depth at which the water in the geyser was found to have a temperature of 126·5°, the boiling temperature would be 136°. At no point does the temperature of the water reach the boiling point for the pressure to which it is subjected.

[At this stage of the lecture the cork flew from the mouth of the model of the strokkur, and a copious stream of boiling water was prejected to the ceiling of the theater.]

I must defer the explanation of the geysers until the next lecture.

THE OPTIC WONDER is the name of a scientific toy just introduced by the London Stereoscopic Company. It is a creator of apparently solid form out of a mere line. A piece of wire or glass, bent to the form of one side of a cup or vase, is made to faithfully portray the whole article. This is done by simple mechanical means, a quick motion gearing being the whole secret. It illustrates in a striking manner the persistence of vision and can be rendered instructive as well as highly amusing.

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TURNING A MOVABLE WHEEL AROUND A FIXED WHEEL.

"How many revolutions on its own axis will a movable wheel make in rolling around a fixed wheel of the same diameter?" Answer, "One."

The question and answer thus originally published, although apparently simple and direct, have given rise to a very animated and extended discussion. The subject has proved to be an interesting topic at the tea table, counting room, work bench, machine shop, and various colleges, schools and societies.

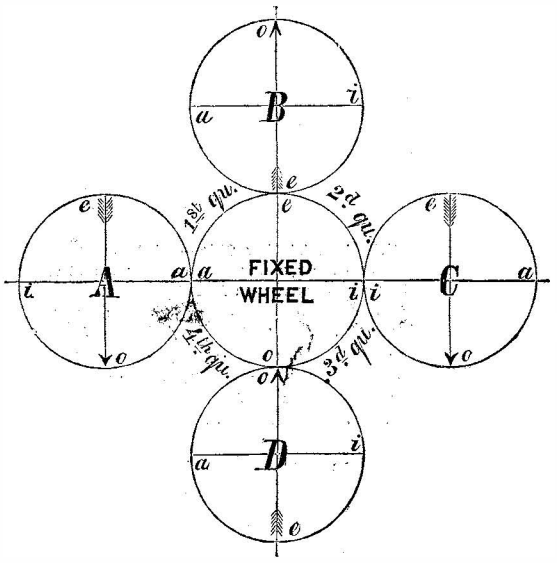
This lively interest is probably not due to any thing contained in the mere question itself. But it is one of those queries that easily and, with some minds, imperceptibly lead off into a variety of collateral questions, each of which involves its special consideration. It is, therefore, a first-rate thing to talk about, readily stirs up conversation, and amid its prolific branches everybody quickly finds something to say, and we all take pleasure in hearing ourselves speak.

The pile of letters we have received upon the subject is of itself a curiosity. They come from esteemed correspondents in all parts of the country—professors, engineers, mechanics, mathematicians, students, and scientists. The mass would fill a large volume. A variety of opinions are expressed in these letters. Some of the writers affirm that it is equally correct to say that the wheel makes one revolution on its axis, or that it makes two revolutions. Take your choice, say they, both answers are right. The majority conclude that the moving wheel makes one revolution on its own axis and one revolution around the axis of the fixed wheel.

We subjoin a few selections:

MESSRS. EDITORS:—Referring to the diagram in your last number, it is evident enough that, in passing from the position, A, to that of B, the rim of the wheel travels only over the space from *a* to *e*, or one quarter of its circumference, and of course one quarter of a revolution on its own axis; but in so passing it has also made one quarter of a revolution on the fixed wheel; or, in other words, the axis itself has made one quarter of a revolution. These two together give the wheel the appearance of having made one half revolution on arriving at B. This is my explanation, and I think it is correct.

Portland, Me. G. L. BAILEY.



MESSRS. EDITORS:—Through a singular coincidence, at the very time you published L. M.'s diagram of the moving wheel passing around the fixed wheel, I had just conceived a device requiring precisely that movement. Now had the moving wheel revolved twice it would have interfered with my purpose; but as it revolved but once it effected the object of its use perfectly, I therefore side with you and say "one." As you do not explain why there can be but one revolution, will you allow me to do so, and thus settle this "still vexed Bermoothes?" In the first place, if a wheel be one foot in diameter its circumference will be six radii or three diameters in length; that is, three feet. One revolution of this wheel, then, will measure—from any given point of contact with any surface, whether straight or curved—just three feet, neither more nor less. I presume none will deny this. If there were two revolutions, there must be a measurement of six feet. On reference to your diagram it will be perceived that the moving wheel, from the starting point, *a*, to its return to the same point gives just one circumference. *Ergo*, there can have been but one revolution.

But I see the cause of the delusion into which the dualists have fallen. It is a mere optical illusion rising from the apparent positions of the arrows in the circular movement. Let them follow the line made by the point, *a*, in the passage of the moving wheel, and they will see that it makes but one parabolic curve, ending at *a* again. If two revolutions were made, the point, *a*, must touch the circumference of the fixed wheel at some intermediate point. and two parabolic curves must result. It is quite clear that neither of these occur, *ergo*, there can have been but one revolution. C. H. G.

Saco, Maine.

MESSRS. EDITORS:—I think the subject in regard to a wheel rolling around a fixed wheel of the same diameter is somewhat misunderstood by your various correspondents, and might be settled by stating that to make one revolution it is necessary for the axis to make one revolution around the said fixed weeel. This is the natural consequence of one body revolving around another of the same diameter. A given point on the axis must keep the given distance from the axis of the fixed wheel. J. P. W.

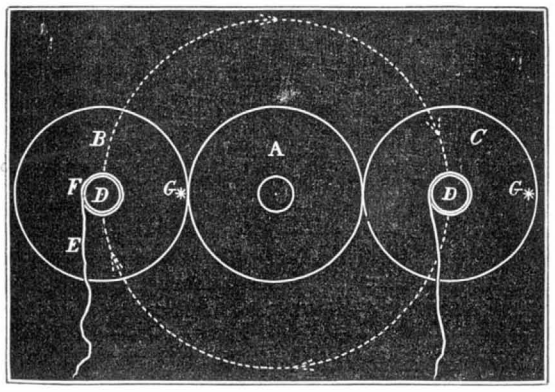
Gennington Furnace, Pa.

MESSRS. EDITORS:—In discussing the fixed and loose wheel question your correspondents have omitted the main point in the problem, viz., the axis. The difficulty with L. M's diagram is, that it does not represent the case. The phrase revolutions on its own axis, supposes the axis or arbor not to perform any part of a revolution. [See, diagram in last number.] Let *a* be the arbor or axis, (infinitely small, if you choose], *a'* the loose wheel: now as the wheel advances through the first quarter the point, *a'* recedes with reference to the arbor *one* quarter: and similarly through the remaiuing quarters, the wheel revolving *once*.

Rochester, N. Y. F. H. CLEMENT.

MESSRS. EDITORS:—Let A be a fixed wheel, and B a movable one. To the shaft, D, of B, attach a thread, E, at F. Holding the thread in the left hand, with the right hand move the wheel, B, around the fixed wheel, A. When B reaches the position of C you will find the thread, E, wound *once* around the shaft, D, and when B reaches its starting point, or first position, the thread, E, will be wound *twice* around D,—which could not possibly be the result did B make but *one* revolution. H. ANDERSON.

Peekskill, N. Y.



[If our correspondent will attach the thread to any convenient point upon the periphery of the wheel, B, and allow the thread to wind upon the periphery as fast as the wheel revolves upon its own axis, he will find that when the wheel, B, has traveled once around A, the thread has been wound only once upon B.]

MESSRS. EDITORS:—I am sure that it is very plain to see that a wheel only turns once on its own axis in rolling around another one of the same diameter. For instance, take, D, on page 106, Vol. XVIII for the starting point. The point of the arrow is pointing direct to the center of the fixed wheel, now L. M. and Professor Hepburn or any body else will have to bring the wheel D around to its starting point to make the arrow point again towards the center of the fixed wheel. WM. F. GORDON.

Ann Arbor, Mich.

MESSRS. EDITORS;—"How many revolutions *on* its own axis will a wheel make in rolling once around a fixed wheel of the same size"? In my opinion the supporters of the two revolutions, overlook a very important point in the case. They all seem to argue on the supposition that the position of the axis of the moving wheel remains unchanged. This is not the case. The side of the axis for instance, A, which faces the fixed wheel, A, stands east, in A, south in B, west in C, and north in D.

Let us take the diagram of L. M. once more, with this difference only that we mark the axis with a small arrow to show the way it moves around the fixed wheel. Now let us follow Professor Hepburn. He says "we will now start at A, *i* in the moving wheel is now west, arriving at B, *i* will be east; pursuing on to C, *i* will be then west again, being a full rotation made by the outside wheel." Not at all. At the time when the rolling wheel arrives in C, its axis has changed its position also, the side of the axis which faces east in A, stands west in C, that is, has traveled half around the fixed wheel, with the same speed as the rolling wheel and in the same time the rolling wheel has revolved *half* around its axis, as the position of the small and large arrow clearly shows, the point being just opposite from what they were at the starting point. Not before the wheel shall have reached the starting point, the point of the arrows will regain the same position as they had at starting, and the outside wheel will have made one full rotation around its axis. The position of *i* in C is the same as in A, Professor Hepburn says, therefore he argues, the wheel must have made one full rotation, but he overlooks the fact, that this position is gained by two movements, different from each other, first by revolving half around its axis, second by moving half around the fixed wheel.

It is further evident that the rolling wheel makes only one revolution around the fixed wheel as the point A never strikes the periphery of the inside wheel, until after it comes to the starting point again, consequently it cannot make two revolutions around its axis in the same time it makes only one. J. JOBSE.

Milwaukee, Wis.

MESSRS. EDITORS:—L. M. demonstrates fully that a wheel rolled round another of the same diameter revolves "twice" on its own axis. You still adhere to "once." I have tried it. It certainly revolves twice on its own axis in rolling around the fixed wheel once. Now use a point on the circumference of a wheel as a center, and revolve it around that center, and the wheel revolves once on its axis. Now, if that wheel is rolled round a fixed one of same diameter, or any other diameter, it will revolve as many more times than once on its axis as the fixed one is larger than the movable one; but if a point on the axle of the movable wheel is kept in the same relation to the fixed wheel of same size, while rolling round it, it will as certainly revolve only once on its own axis, but the wheel will make two revolutions; in the one case the axle of the movable wheel revolves once, in the other it does not.

JAMES TAIT.

Rochester, N. Y.

[The above strikes us as being a little mixed.]

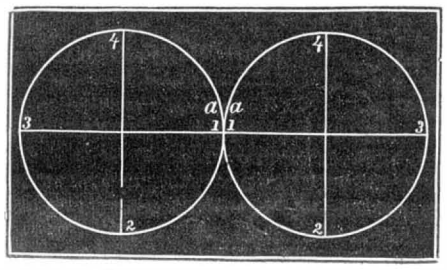
MESSRS. EDITORS:—Feeling like all of your other correspondents confident that we see the point, we are constrained to say that, as paradoxical as it may seem, both the SCIENTIFIC AMERICAN and the "half bushel of letters," are right; or, in other words, that the shield is gold upon that side and silver upon this. In proof of which, we claim that if we detach from an ordinary cart one wheel, and place it upon and secure it to the ground and place the other wheel upon the ground, also with the axle (with tongue attached) inserted and standing erect, the periphery of the two wheels in contact, and now take hold of the tongue and draw the loose wheel around the stationary one, keeping the bottom of the axle in the same relative position to the stationary wheel, we shall find that the loose wheel has made two revolutions and the axle one in the same direction, hence the wheel has turned but once upon its axis. But if we take hold of the tongue and cause the loose wheel to pass around the stationary one, keeping the tongue always pointing toward the same point of the compass, say to the east, we prevent the axle from turning, in which case the wheel will revolve twice upon its axis. G. H. & A. S.

Plano, Ill.

MESSRS. EDITORS:—The problem referred to in to-day's issue, "How many revolutions on its own axis will a wheel make in rolling once around a fixed wheel of the same size?" is merely another form of the old question, "Does the moon turn on its own axis in revolving around the earth?" If the moon turn on its axis, then the wheel makes two revolutions, if not, *not*. If the wheel when dragged (not rolled) around the fixed wheel (keeping the point, A, at all times in contact) revolves once on its own axis, it would revolve twice on its own axis if rolled around. F. S. COBURN.

Boston, Mass.

MESSRS. EDITORS:—I see in perusing your paper of the 15th February that several have expressed their opinion in regard to the number of revolutions that a wheel will make in rolling around a fixed wheel of the same size. Now I con-



tend that it makes only one. The above diagrams are divided into quarter sections and you will notice that the wheel commences to revolve at *a* or No. 1 and consequently the figures on the movable wheel will exactly match the figures on the fixed wheel therefore if *a a* be the starting point when the wheel arrives at *a a* it has certainly made a revolution around the fixed wheel and it has made only one revolution as the quarter sections on the two wheels will show.

Sandy Hook, Conn. M. J. B.

MESSRS. EDITORS:—I am astonished at your patience with your subscribers, in setting type and diagram to their arguments in reference to the movable wheel around a fixed one of like diameter. I am mortified that any one who is a conftant reader of the SCIENTIFIC AMERICAN cannot comprehend a problem so simple. It may be demonstrated to a child in the following way: Take two wheels whose circumferences are three feet; glue on their periphery a tape measure laid off in inches make one stationary—then begin to revolve the other around it, placing figure 1 on each together. If on rolling it around three feet on one only reaches eighteen inches on the other, then L. M. is right and you are wrong.

South Union, Ky. H. L. E.

MESSRS. EDITORS:—When perusing No. 7 of the SCIENTIFIC AMERICAN I was somewhat surprised at the lively controversy excited by L. M.'s problem regarding the number of revolutions a wheel will make on its own axis in rolling once around a fixed wheel of the same size. The difference in opinion between you and your correspondents results from a mere oversight on the part of the latter when making their diagrams. The true answer to the question raised is very simple: If the plane of the movable wheel is perpendicular to that of the fixed one (which is the supposition I believe), there will be only *one* revolution; if both wheels are in the same plane, as represented in Prof. Hepburn's diagram, the number of the revolutions must necessarily be *two*; for in the one case the distance traveled is equal to the periphery of the fixed wheel, while, in the other case, the distance traveled is equal to the periphery of a circle described through the center of the movable wheel with a radius equal to the sum of the radii of both, *i. e*, exactly double the periphery of the fixed wheel. Hence the palm of victory belongs to "one."

Milwaukee. C. H. DOERFLINGER.

MESSRS. EDITORS:—Is not the diagram and demonstration of L. M., in the SCIENTIFIC AMERICAN of the 1st inst., exactly the converse of Watt's "sun-and-planet" wheels in the steam engine? "A toothed wheel called the sun wheel, was fixed on the axle of the fly wheel to which rotation was to be

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imparted. The wheel called the planet wheel, having an equal diameter, was fastened on the end of the connecting rod so as to be incapable of revolving. This contrivance, although in the main inferior to the more simple one of the crank, is not without some advantages: among others, it gives to the sun wheel double the velocity which would be communicated by the crank; for in the crank one revolution only on the axle is produced by one revolution of the crank, but in the sun-and-planet wheel two revolutions of the sun wheel are produced by one of the planet wheel: thus a double velocity is obtained from the same motion of the beam."

I quote from Dr. Lardner's work on the steam engine published at London in 1851, pp. 118-19, where the *modus operandi* is described. Now fix the sun wheel and give rotation to the planet wheel of Watt, and they are represented in the diagram of L. M. Instead, then, of the sun, the planet wheel must make two revolutions in passing round the former.

Philadelphia. J. J. W.

MESSRS. EDITORS:—We will take L. M's diagram, on page 67, and while I "go one eye on it", (for I have lost the other) you may "go two eyes on it", unless you have been equally unfortunate. Make the axis of each wheel fixed and start the wheels at the point, *a*; revolve each wheel once and the same points come together again, and there has been two revolutions made. Now make one wheel fixed and revolve the other around it, and of course it must make two revolutions, but while the wheel has made two revolutions, what has its axis been doing? it has made one revolution, and the wheel has actually made but one revolution on its own axis.

Gents, you asked a question on the axis of the wheel, and looked at and talked of the periphery all the time.

Marshalltown, Iowa. S. L. LOVELAND.

MESSRS. EDITORS:—You said the movable wheel made "one" revolution on its own axis, L. M. said "two." Again, on page 105, the question comes up, and the writers all oppose you, and say "two." Now I say you are right, it makes "one." The movable wheel has two centers around which it revolves. First, the point at which it rests on the fixed wheel, and around which it makes one revolution. Second, Its own axis, around which it also makes one (and only one) revolution. S. H. BLACKWELL.

Kendall's Mills, Me.

"P. C." is apparently in doubt upon the whole subject and in order to arrive at a clear understanding of its bearings he asks how many times a one foot wheel will revolve on its own axis in rolling around the inside of a three foot hoop, or the outside of a one inch wheel. He also asks other questions equally pertinent. We think it better to settle the original question.

MESSRS. EDITORS:—In regard to the article headed "Turning a movable wheel round a fixed wheel," in last number, I would beg to inform L. M., of Germantown, Pa., that I have some leather belting from one of the best manufacturies in the country to sell, and would like to have him purchase some, he measuring it on a fixed wheel from the circumference of a movable one of same size—three feet in diameter, for instance. Two revolutions would equal eighteen feet ten inches. I will consider that it makes only one and one quarter revolutions in traveling round the fixed wheel. He will thus get eighteen feet ten inches for eleven feet nine inches.

La Salle, Ill. WM. B.

Manufacture of Soda and Potash.

By A. G. Hunter, of Flint, Wales, temporarily residing in Fair Haven, Conn.

The object of my invention is to convert chloride of sodium (common salt) into silicate and carbonate of soda and caustic soda, and chloride of potassium (muriate of potash) into silicate and carbonate of potash, and caustic potash, with the production of muriatic acid from the said chlorides. I effect this by subjecting the chloride to be decomposed, to a heat sufficient to volatilize it, and causing the chloride vapor to act upon highly heated silica in the presence of aqueous vapor, whereby a silicate of soda or silicate of potash and muriatic acid are produced.

The muriatic acid is condensed and utilized for any of the purposes to which it is usually applied, and the silicate of soda or of potash under treatment is converted into a silicate soluble in water by fusing or boiling it with carbonate of soda or caustic soda, or with carbonate of potash or caustic potash, and the soluble silicate of soda or of potash thereby produced is dissolved in water and converted into the corresponding carbonate by treatment with carbonic acid, or into the corresponding caustic alkali, by treatment with caustic lime, baryta, or magnesia. Several forms of apparatus may be employed to expose the silica to the action of the alkaline chloride vapor, among which are the following;—

A stationary reverberatory furnace, on the hearth of which, nearest the fire, is placed the chloride to be treated, and beyond it is placed the silica or silicious mineral to be acted on, steam being admitted to the furnace at the fireplace, so that flame or heated steam, and chloride vapor all pass together over and among the silicious mineral, thence through a condenser for the resulting muriatic acid, and thence to a chimney. The fused silicate of soda or of potash is allowed to flow out through an aperture in the furnace provided for this purpose.

A vertical furnace, similar in construction to an iron founders's cupola for melting iron, or to an iron smelter's furnace for making pig iron; the fuel, chloride to be treated, and silicious mineral being supplied from the top of the furnace, air and steam being admitted by tweers near the bottom of the furnace, the fused silicate flowing out at a suitable tap hole near the bottom of the furnace, and the muriatic acid conducted from the furnace to a condenser. In employing this kind of furnace, the muriatic acid may be led off either from a hood covering the top, or from an opening in the side of the furnace. In the latter case, the furnace top should be closed, either by a movable bell-shaped cover, or by enough depth of the materials to be furnaced above the muriatic acid outlet-flue, as to prevent the escape of vapors, as is ordinarily practised by iron smelters who utilize the waste heat from their blast furnaces for steam boilers or air superheaters.

A stationary or revolving horizontal reverberatory furnace, or a vertical cupola furnace, in which the chloride to be treated is volatilized, its vapor mixed with steam and the mixed gases, viz: the furnace flame, chloride vapor, and steam passed into a tower lined with fire brick, and filled with the silicious mineral to be acted on, the resulting silicate flowing down and out at the bottom of the tower, and the muriatic acid led off from the top of the tower to a condenser.

It is advantageous to cause the melted silicate produced in any of these forms of furnace to flow directly into another furnace, to be fused with its corresponding caustic or carbonated alkali, or to flow directly into a solution of its corresponding caustic or carbonated alkali, to be by either of these modes converted into a soluble silicate of the alkali under treatment. It is advantageous to use, (when they can be cheaply and readily obtained,) silicious minerals containing silicate of the alkali whose chloride is to be treated, such as felspar or granite in the case of chloride of potassium.

The proportions of materials are readily determined by practical chemists, from their chemical equivalents, and from the composition of the materials from time to time treated, care being taken at all times to present sufficient silica to the chloride vapor, and sufficient caustic or carbonated alkali to render the resulting silicate soluble in water. The silica or silica of lime, baryta, or magnesia precipitated from the soluble alkaline silicate is useful for glass makers and potteries. The soluble alkaline silicate may be decomposed by injecting carbonic acid into an aqueous solution of the silicate till the silica is precipitated, and the solution of carbonated alkali then run off from the silica and boiled to dryness, or the solution of alkaline silicate may be decomposed by caustic lime, baryta, or magnesia, the silicate of lime, baryta, or magnesia allowed to settle, and the solution of caustic alkali run off and evaporated till sufficiently concentrated to solidify when allowed to cool.

BREAKERS AHEAD.—One of our city papers publishes the startling predictions of Professor Delisser, who declares that a series of celestial and terrestrial phenomena are close at hand. He says that on the night of the Feb. 27th, in the Western heavens there will be a conjunction of the moon with Jupiter and Venus, and three nights later Jupiter will pass Venus by only twenty three seconds of a degree. The results of these conjunctions and perturbations will be atmospheric commotion, electrical discharges, heavy gales, and high tides, with a succession, through the remainder of the year, of the unpleasant terrestrial agitations of which a foretaste has already been granted to our West India neighbors. With vast inundations, volcanic eruptions, and quakings of the earth, what a sensation is in store for us. The correspondent of the *Mechanics' Magazine*, whose hurricane preventer we noticed in our last issue, should perfect his invention, and act on our suggestion for a defense against earthquakes.

MANUFACTURING, MINING, AND RAILROAD ITEMS.

It appears from the report of the English Secretary of Legation at Berlin, that of the railways in use in Prussia, 225,947 miles belong to the State, and 201,833 miles are private property, under the control of the State, and 487,587 are under private administration; this includes 86,598 miles of Prussian railways in foreign territory, but does not include 12,833 miles of foreign railway on Prussian territory.

Over five hundred tuns of borax was manufactured in California last year. The pure salt is found but in few localities in the world, and its existence in great abundance at Borax Lake makes the deposit a very valuable one. Refined and delivered in San Francisco, the salt costs but $90 per tun; usual market value in that city, about $280 per tun. As but little borax is required for consumption in California, the most of it is shipped.

On the one hundred and forty four miles of track on the Hudson River railroad, one hundred and forty-seven flagmen are employed, whose sole business it is to pass over the entire length of the road after the passage of every train, day or night, inspecting each rail and tie, and seeing that there are no obstructions of any kind to render travel dangerous. The fact that three million passengers were last year transported over the line without a single loss of life may be attributed to these precautionary measures.

The Kentuckians are beginning to take an interest in the rich mineral deposits of their State. The mountain counties are known to abound in iron, coal, copper, and nearly every species of mineral wealth. Indian traditions used to tell of the Cherokees of North Carolina going to Kentucky for silver and gold, which they made into horseshoes, and the latest discovery of a rich vein of silver in Rockcastle county, where exists an ore yielding forty-five per cent of the virgin metal, may be the realization of these ancient legends.

The proposed bridge across the Hudson, to which we referred in a late issue, is to be built by the Hudson Highland Suspension Bridge Company, at some point between Verplanck's and Buttermilk Falls. In addition to its use by the Erie and New England Railroad, the projected line to connect Boston with the coal regions, via New Haven, the bridge, if built, would undoubtedly be used by the New York and Erie road, also by the West Shore railroad from Albany. The Oswego and New York Midland road would unite with the Erie at Middletown, and follow the same general route. The capital of of the bridge company is fixed at $2,500,000, and it is stipulated that the structure shall be complete by the 4th of July, 1871.

The Omaha *Herald* vouches for the great value of the gold deposits of the newly discovered Sweetwater mines, which, it asserts, indicates an immense addition to the mining industries of the Mountain region. That these mines are veritable discoveries, and are rich beyond estimate, is as true as any other well established fact can be. The location of this new mining interest with in striking distance of the Union Pacific railway, affords great advantages for their speedy development.

The plan proposed fifteen years since, of tunneling the Niagara river at Buffalo, has been revived, and is now in the hands of capitalists and practical men both in Canada and New York. If, as seems probable, the project is carried out, a direct, uninterrupted railroad connection will be established between Buffalo and Chicago, via Canada.

The new watch manufactory at Springfield, Mass., turns out time pieces claimed to be equal to any watch of foreign make. Watch keys are entirely dispensed with, for, besides the stem-winding arrangement, the hands may be set when required by means of a new contrivance, lately introduced.

A correspondent wishes us to call attention to the great mineral resources of Southern Illinois. He reports a fact known to very few beyond the immediate neighborhood, that a few miles southwest of Cobden Station, on the Illinois Centrail railroad, there is one of the richest beds of iron ore to be found anywhere in the West. The deposit forms a lofty hill, which is known in that section as the "Iron Mountain." The surrounding country is well wooded, there is a copious supply of water, limestone suitable for smelting purposes is found in the vicinity, and beds of bitumous coal underly nearly the whole of that section of the State.

The palace coach "City of Chicago," burnt a few days ago while running on the Burlington and Quincy road, was built at an original cost of $24,000 The fire is believed to have been caused by the explosion of a kerosene lamp in the car, and to guard against any possible repetition of such an accident, the officers of the road have taken what may be called in this age of progress a backward step in ordering the substitution of the more primitive source of illumination—candles.

A stock company has been organized in Boston for making wood veneers, the new substitute for wall paper-hangings. The price is about the same as a good quality of paper, and they are applied in the same way, with paste. Age augments, rather than destroys, the beauty of these hangings, and being varnished, or finished in oil, the walls may be cleaned in the same way as ordinary furniture. Although first brought to public notice by the Boston papers, the natural inference that such wall hangings were first made at the "hub" is an erroneous one. A firm in this city introduced them, to our certain knowledge, many mouths ago.

The Chicago, Rock Island and Pacific road are building a refreshment car, furnished with a lunch counter for the benefit of the passengers. The car is intended to run in the middle of the train, with every facility for free ingress at either end.

It is the opinion of many practical miners that in five years California will be at the head of the copper producing States. Large lodes, containing ore varying from ten to twenty-five per cent of the pure metal, are found in no less than a dozen counties, from Del Norte to San Diego, lodes, though worth millions, now lying idle on account of the high cost of freight, the dearness of fuel, or the lack of skilled labor.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

PACKING TOBACCO.—Louis H. Marburg, Baltimore, Md.—This invention relates to the packing of smoking tobacco in small bags or pouches and consists in applying an elastic band to said bags, whereby they close automatically, and by the use of which they can be instantly opened without the necessity of untying a knot.

MACHINE FOR DISTRIBUTING GUANO AND OTHER MANURES.—John Franklin Thomas, Adamstown, Md.—In this invention the escape of the fertilizer from the feed box is adjusted by a couple of paralell ruler slides and the agitating apparatus is thrown into or out of gear by a novel and simple arrangement.

WASHING MACHINE.—Josiah Webb, Spartansburgh, Pa.—This invention combines an improved method of rubbing the clothes, with a novel device for adjusting the rubbing blocks to the quantity of clothes or size of the article in the wash, and a device for holding the clothes during the process of washing.

TOOL FOR EXTRACTING NAILS.—David Morris, Bartlett, Ohio.—This improved tool contains several different sets of jaws, for taking hold of nails under different circumstances, combined with a hammer having a curved face.

WHIFFLETREE.—L. G. Binkly, Fairview, Ohio.—This improvement consists in attaching the whiffletree to a spring, which supports it and allows it to yield to a certain extent when any sudden force is brought to bear upon it, thereby preventing it from being broken as well as rendering its action easier for the horse, and imparting a steadier motion to the carriage.

COMBINED WINDOW AND DOOR BLIND AND AWNING.—G. M. McMahan, Mount Sterling, Ky.—In this invention a metallic awning is so constructed that when desired it can be let down and fastened so as to form a strong metallic shutter, or blind, for the protection of the doors and windows of the building.

SYSTEM OF INDEXING FOR RECORDS, ETC.—Abner Campbell, Frederick, Md.—In this invention the names are in the first place arranged in divisions, according to the initial letter of the surnames, as in the indexes in common use. Each division thus formed is then subdivided, according to the initial of the Christian name. The invention consists in this arrangement and in so combining the key of the subdivisions with the index of the divisions, that by their means a name can be found in the index much more readily than by any system hitherto employed for the purpose.

CORN SHELLER.—P. Charles Chipron, Highland, Ill.—This invention relates to an improved corn sheller, and consists of an oscillating cradle set in a box frame and of a fan revolving in a cycloidal drum and blowing away the dust and dirt from the corn in the cradle. The cradle is furnished with longitudinal bars arranged at such a distance apart as to allow the grains to pass through, but not the cob, which passes down the bars outside the cradle. Other devices complete the operation in a perfect manner.

MACHINE FOR BUNDLING AND TIEING FAGGOTS OF KINDLING WOOD.—Frederick A. Myers, New York city.—This machine binds and ties faggots of kindling wood in portable bundles ready for sale. It consits in general terms of a series of boxes borne on a belt which passes them under a chute of peculiar construction, and through which the loose faggots are conducted from the chopper. The filled boxes pass on successively to a position over a pair of clamps, and discharge the faggots therein by means of the hinged bottoms forming part of each box. The clamps are then closed by the action of spring cams, and a binding wire traveling in a groove in the inner face of each clamp passes around and completely encircles the faggots and again enters a slot in a twisting spindle at the bottom of the clamps, by which spindle the wire is locked. The wire is severed by a cutter, and a plunger disk delivers the bound bundle out of the machine. Other devices perfecting the whole render the machine a perfect and practical success. The right for the city of New York in this invention, we are informed, has been sold for the sum of $50,000.

CLOTH RACK.—H. C. Smith, D. A. Kelley, and J. E. Murdock, 2d, Clarksville, Ohio.—This invention refers to cloth racks designed for stores, etc., and consists of a frame bearing horns, and rotating upon a pivot spindle.

COMBINED SQUARE AND GAGE.—Thomas C. Hendry, Union Point, Ga.—The nature of this invention consists in combining a gaging device with a common carpenter's square.

MACHINE FOR FORMING EYES IN METAL RODS.—Charles Kellogg, Detroit, Mich.—This invention relates to the formation of eyes in any metallic rods or bars, but is designed more particularly for the iron rods entering into the construction of bridges or other engineering structures where it is important to preserve the integrity of the iron at the eye by retaining the normal parallel character of the fibers of the iron when the eye is being formed.

HAY HOISTING DRUM.—Henry Strickler, Carlisle, Pa.—This invention refers to a drum or whin for the purpose of unloading hay from a wagon, and is designed to be located in some suitable place near or within the entrance of a barn.

MACHINE FOR CUTTING MEAT.—Jacob Nacher, La Crosse, Wis.—This invention relates to a new and improved method of cutting or chopping meat for sausages, etc., whereby the same is more rapidly and economically done. It consists in two or more knives bolted to a reciprocating cross head, said knives moving up and down between cleaners, whereby the meat is prevented from adhering to the knives.

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HARNESS TRIMMINGS.—Thomas J. Magruder, Marion, Ohio.—This invention relates to a new and improved method of constructing center bar rein hooks and terrets for various styles of harness, whereby the same are more cheaply made, and whereby they hold the rein more securely, and the same being movable, they may be used near the top of the hames, whereby also they make no swell underneath the pad, and the same are less liable to injure the horse by chafing.

PLATE FOR BORING LINKS OR EYES.—Charles Kellogg, Detroit, Mich.—This invention relates to the boring or reaming of the links or eye rods used in bridges and other structures where the distances between the centers of the two eyes of such links or rods require to be exactly equal to some distance taken as a standard, so that the links or rods so bored or reamed shall not vary one with another by any appreciable difference.

CLOTHES DRYER.—Isaac N. Deal, Brooklyn, N. Y.—This invention relates to a new and improved method of constructing an apparatus for the drying of clothes, whereby the same may be folded up either in part or in the whole, so as to be compact and occupy less space than the clothes dryers now in use. It consists of a center stand around which are arranged and to which are hinged any desired number of arms, in such way as that the arms may be folded up upon the center stand. Other devices perfect the whole and render its operation complete.

CORN PLANTER.—Curran W. Henkle, Washington, C. H., Ohio.—This invention relates to a device for planting corn, of that class in which the corn is dropped by a direct manipulation of the operator, as the device is drawn along. The invention consists in a pecullar construction and operation of the parts, whereby a very durable and economical device for the purpose specified is obtained, and one which may be manipulated with the greatest facility.

HAND CORN PLANTER.—Hermann Koeller, and Wilhelm Uecke, Camp Point, Ill.—This invention relates to a new hand corn or seed planter, which is so arranged that it can be adjusted to drop larger or smaller quantities of grain at each stroke, and consists mainly in the use of a perforated disk, which receives oscillating motion, and which rests upon a stationary plate that is perforated with one hole.

CHILDREN'S CARRIAGE.—Julius Bein and Wm. Ulrich, Newark, N. J.—This invention relates to a new child's carriage, which is so arranged that the seat and top can be reversed, and that the latter may be supported above the middle of the carriage, to act as a sun umbrella.

EQUALIZING DOUBLETREE.—Edward Griswold, Joel B. Cramer, and Wm. Blay, Helena, Montana Territory.—This invention has for its object to furnish an improved doubletree, so constructed and arranged as to promote safety and economy, and avoid noise and disarrangement.

SCHOOL DESK AND SEAT.—J. P. Scott, and S. H. La Rue, Lewisburg, Pa.—This invention has for its object to so improve the construction of school desks and seats, as to make them more convenient in use and noiseless in operation.

COMBINED PLOW AND ROLLERS.—J. A. Alley, Clifton, Ind.—This invention has for its object to furnish an improved, combined plow and roller, which shall be cheap, simple in construction, and effective in operation.

CULTIVATOR.—T. Green, and J. Sommer, Metamora, Ill.—This invention has for its object to furnish an improved cultivator, simple in construction, durable, easily adjusted to cultivate roads at any distance apart, and which may be used with great advantage for putting in wheat and other grain.

FISH AND BAIT PRESERVER.—T. D. Kellogg, New York city.—This invention has for its object to furnish an improved means for freezing and keeping frozen meat, fish, etc., for hotels, market and transportation purposes, and especially for preserving bait for fishing vessels so that the voyage need not be shortened and the vessel be compelled to return to port without completing her cargo on account of the bait spoiling.

BEEHIVE.—J. M. Patton, Tipton, Iowa.—This invention consists in a mode of constructing the hive, whereby the temperature of the same is rendered quite uniform, the bees and contents of the hive being protected from severe cold in winter and from heat in summer. The invention also consists in a new and improved trap for protecting the bees from the ravages of the bee moth.

PUMP.—J. W. Douglass, Middletown, Conn.—This invention relates to an improvement in pumps for domestic or household use, such as are commonly termed "yard pumps," and it consists in the application of a valve to the air chamber thereof, whereby the pump may be rendered available for use as a force pump to turn a stream of water a considerable distance, and also rendered available as an ordinary lift pump.

ICE PITCHER.—William Bellamy, Newark, N. J.—This invention relates to an improvement in double walled metallic pitchers designed as receptacles for ice water and iced liquids.

SKIRT HOOP FASTENING.—James F. J. Gunning, New York city.—This invention relates to a fastening for securing the ends of skirt hoops together and has for its object the production of such a fastening which, while it will firmly secure the ends of the hoop together, will admit of said ends being readily disconnected at any time when necessary or required. The invention is more especially designed for hoops to be used in skirts which are woven with or have pockets formed in them to receive hoops so that when the skirt requires to be washed the ends of the hoops may be disconnected and the latter drawn out from the skirt and after the skirts are washed the hoops replaced in them and their ends secured by the fastening.

COMBINED FRUIT MILL AND PRESS.—Henry A. Holderman, North Manchester, Ind.—This invention relates to a combination of a fruit mill and press designed for family use and for the manufacture of cider, wine, etc. The object of the invention is to obtain a simple, economical and efficient device for the purpose which, so far as expense and the convenience of operation are concerned, will be within the reach of all persons of the community requiring such an article.

DIVERTING GAME.—H. Jackson, New York city.—This invention relates to a new and diverting game which is termed the "Game of the Government," and it consists of a box divided into a suitable number of compartments representing the treasury and different departments of the Government and in using, in connection with the box, a series of counters and cards which are played in such a manner as to afford much amusement.

STAGING FRAME.—Horace Wood, Leverett, Mass.—This invention relates to a staging frame designed to facilitate the applicatton of covering materials to the pitch roofs of buildings. The invention consists of a framing constructed in a novel manner and provided with windlasses operated in a novel way, whereby the staging frame may with the greatest facility and safety be raised from the eaves to the peak of the roof and lowered from the peak to the eaves by workmen on the staging frame.

MANUFACTURE OF PAPER AND OTHER BAGS HAVING PASTED SEAMS.—James Arkell, Canajoharie, N. Y.—This invention relates to a machine for manufacturing paper and other bags having pasted seams direct from a continuous roll. The machine folds the paper or other fabric and pastes it so as to form a flat tube and then creases and cuts it at proper points in such a manner as to admit of the bottoms of the bags being properly folded and formed and finally cuts the pasted flat tube into suitable lengths. The folding and pasting of the bottoms of the bags to complete the same being afterward and separately performed.

SOLDERING TIN CANS.—John G. Borden, Brewster Station, N. Y.—This invention relates to a new apparatus for soldering tin cans or all other cans which have round heads.

FILTER FOR CISTERN WATER.—Nicolas Ganner and Herman Bader, Cape Girardeau, Mo.—This invention relates to a new device for filtering rain water on its passage from the roof of a building to the cistern. Such water is generally filled with leaves, pieces of shingles and other impurities. The object of this invention is to clear it of such impurities before it enters the cistern.

GRAIN THRASHING MACHINE.—Felix A. Finn, Salt Point, N. Y.—The object of this invention is to obtain a machine by which grain may be thrashed by power and without bruising or breaking the straw. The invention consists in the employment of one or more rotating cylinders provided with pivoted bars or flails, and placed within a box having an inclined floor or bottom whereby the straw may be fed along underneath the beaters or flails by the action of the latter and the grain thoroughly thrashed out of the heads. The invention also consists in a novel manner of operating or giving the necessary shake motion to a screen which separates the grain from the straw.

CROZING MACHINE.—Henry DeBus, Cincinnati, Ohio.—This invention relates to an improvement in the construction of a machine for cutting the croze or recess in the ends of barrel staves for receiving the head of a barrel.

CARPET LINING MACHINE.—Joel F. Fales, Walpole, Mass.—This invention relates to an improvement on a carpet lining machine.

SELF ACTING WAGON BRAKE.—J. A. Williams and W. W. Williams, Mattoon, Ill.—This invention relates to an improvement in a wagon brake or wheel lock, and consists in a self-acting arrangement of the brake in connection with the singletrees of a wagon or other vehicle.

STEAM GENERATOR.—V. D. Anderson, Milton, Wis.—This invention has for its object to furnish a portable apparatus for generating steam for domestic and other purposes.

TOP PROPS FOR CARRIAGES.—John F. Mullin, New York City.—This invention consists in so forming the prop, that the working of the joint up and down shall not loosen the nut by which the joint is fastened to the prop.

WAGON SPRINGS.—Elijah Horton, Okee, Wis.—This invention relates to a method of applying springs to wagons, whereby the ordinary lumber wagon is rendered suitable for the transportation of many articles to which it is not adapted as it is ordinarily made.

CORN SHELLER.—Michael Housman and Simeon Housman, Huntington, Ind.—This improvement consists in surrounding the claw projections or clamps of the corn sheller with a shell or shield for the purpose of preventing the grains of corn from scattering, and to protect the hand of the operator from injury.

GRAIN SIEVE.—Jacob Corson, Clinton, N. J.—This invention relates to a new grain sieve, which is so arranged that the grain may be most thoroughly separated from dust and dirt, and that the small grain may also be separated from the large grain.

AXLES FOR VEHICLES.—William Knoch, Alleghany City, Pa.—This invention relates to a new manner of arranging the spindles around wagon axles, so that the hub can be easily oiled and that the spindle can be easily replaced when desired.

BELT COUPLING.—John L. Thomas, Newburgh, Ohio.—This invention relates to a device for coupling pulley belts, and the improvement consists in a metal clamp applied to both sides or ends of a lap of a belt, to hold them together.

FIRE AND BURGLAR ALARM.—O. E. Pickett, North Auburn, Pa., and R. S. Luce, Lawsville, Pa.—This invention relates to improvements in the construction of a fire and burglar alarm, which consist in an arrangement of tripping devices in connection with a clock movement and bell, whereby an alarm is sounded when by fire or the entrance of a burglar in a house the connection is broken by which the alarm is held.

SEWING MACHINE CAST-OFF.—Edmund M. Comery, Hudson, Mass.—This invention relates to an improvement in the construction of a cast-off for a wax thread sewing machine, and consists in a slide collar fitted to the needle and attached by a pin joint to a bar or handle.

SAFETY CLASP.—C. E. Candee, Jersey City, N. J.—This invention relates to an article to be used by travelers and others in securing their passage tickets to their persons in railroad cars, and to be used also as a shawl pin and for purposes of a similar nature.

GOLD WASHING MACHINE.—Seth L. Beckwith, San Francisco, Cal.—This invention relates to a gold washing machine, and consists of a washer pan hung over a receiver.

CLOTH GIG.—Osimus M. Stillman, Westerly, R. I.—This invention relates to improvements in the construction and operation of gigs for raising the nap upon woolen cloths, and consists in simple devices for bringing the cloth into contact with one raising cylinder at four distinct points or places.

PHOTOGRAPHIC PRINTING FRAME.—Samuel F. Conant and Horace A. Manley, Showegan, Me.—This invention relates to a frame or clamp for holding the negatives while the photographs are being copied or printed therefrom. The object of the invention is to obtain a device for the purpose specified, which will admit of the paper and negative being readily fitted in and removed from the frame, the progress of the printing for copying readily inspected from time to time, and the negative and paper firmly retained in contact on the frame.

STEAK CRUSHER.—Alfred Castellaw, Chester, Ill.—This invention consists in constructing a machine with a fluted cylinder, which is geared to another smooth or plain cylinder or roller, in combination with a suitable frame, the cylinders being revolved therein, and the steak to be crushed being passed between them.

BEEHIVE.—James A. Jackson, Macon, Mich.—This invention consists in a novel manner of constructing a beehive, whereby a large number of spare honey boxes may be used or applied, the bees allowed to work with facility, and moths entrapped so that the bees will not be materially annoyed by them.

TIME REGISTER.—Wm. A. L. Kirk, Hamilton, O.—This invention relates to an improvement in the construction and arrangement of a time register, or instrument for recording the working hours of operatives in a shop or factory, and consists in a deep, horizontal cylinder, divided circumferentially into twelve compartments or other subdivisions, corresponding to hours, or fractions of time; the cylinder thus subdivided is fixed on a vertical spindle, attached to a coil spring, which gives it motion when free to move, and is provided with a catch lever connected with a clock movement that trips the lever from time to time, as desired to allow the time box to revolve a certain space to change the position of the compartments therein for receiving checks of the workmen as they commence or quit work to indicate the time, which is registered by a series of figures in the circumference of the cylinder.

WATCH.—Arthur Wadsworth, Newark, N. J.—This invention relates to the main-spring barrel of the movement of a watch, or other time pieces, and the principle of the invention consists in so constructing either one or both of the heads or end plates to such barrel, that when applied to the body portion of the barrel, such body will be confined and bound upon and around its outside, and thus strengthened and stiffened, as well as in many other respects improved and rendered more efficient and practical.

SODA WATER BOTTLES OR VESSELS FOR CONTAINING BEVERAGE FLUIDS.—Wm. W. Timmons, Rahway, N. J.—The particular object of this invention is to provide a portable substitute for soda water fountains, but the invention may be applied to other purposes for which it is suitable. It consists of a chamber attached to or forming part of the vessel containing the pure soda water or other fluid, the chamber containing the acid preparation or other ingredient which escapes therefrom and communicates with the soda water or other fluid when the latter is being poured out, whereby the effervescence takes place at that time.

HANGING WINDOW SASHES.—Charles H. Palmer, New York city.—This invention relates to a new manner of hanging window sashes, and its object is to so arrange the hanging that the sashes can be moved up and down as usual, and that they can be turned into a horizontal position so as to open the whole window whenever desired.

WEEDING IMPLEMENT.—C. S. Jewell, Black's Mills, N. J.—This invention relates to a new weeding implement, which is so arranged that, by its aid, noxious weeds can be easily drawn out of the ground, without cutting them.

CHISEL.—Amos B. Simonds, Youngstown, Ohio.—This invention relates to an improved chisel or tool for turning the heads of bolts or other articles, in connection with the turning of which hand tools are used. The tools or chisels heretofore used are made with solid shanks, and when the cutting part is worn out the whole tool is destroyed and rendered useless, and the present invention consists in so attaching the cutter to the shank of the tool that it can be removed or detached therefrom when worn and a new one applied.

APPLICATION OF SPRINGS TO WHEEL VEHICLES.—Charles L. Rice, Dunmore, Pa.—This invention relates to an application of springs to wheel vehicles, whereby the body of the vehicle is prevented from moving longitudinally forward or backward, and also prevented from tilting sidewise, in an appreciable degree, while at the same time the body is better supported than usual by the springs.

HEATING APPARATUS.—Thomas Williams, and Joseph J. Yates, New York city.—This invention relates to a device for evaporating the liquors in whisky distilleries, and for other purposes, in which liquids are to be heated by blowing steam into them. The invention is designed to overcome the difficulties heretofore experienced, that when the steam was cut off a vacuum was created in the steam pipe so that the material in the mash, or other pan, flowed into the pipe, and clogged the same, thereby creating frequent annoyance and loss of time.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisemets at $1 00 a line, under the head of "Business and Personal."

☞ *All reference to back numbers should be by volume and page.*

G. M. D., of Ill.—"What is the best steam joint cement that can be ready for use at any moment? How can I protect rubber packing from burning out by steam?" By "steam joint cement" we suppose you mean a cement for sections of steam pipes which are not required to be taken apart after being connected. The ordinary cement, composed of iron filings or borings, salammoniac, and water—a little sulphur being added if desired—is what you want. The exact proportions are not of great consequence, the iron filings constituting the mass. For two quarts of the iron filings, however, two ounces of salammoniac are sufficient. We do not approve of the addition of sulphur, but if used it should be in very small quantity. A packing, to be removed if desired, is made by mixing two parts white lead with one of red lead with linseed oil, making a thick paste, and used with canvas or leather glands, the pipe joints being held by bolts and nuts. Rubber packing will be more or less affected by a high temperature. For packing steam engine stuffing boxes, etc., there is manufactured a packing of cotton webbing in combination with rubber, which is durable and effective.

P. H., of Ky., asks how the glazed and highly polished surface on linen is produced. There are preparations in the market which pretend to produce this effect, but probably much of it is due to the skill and "elbow grease" of the operator or the use of heavy calendering rolls.

D. J. W., of Ky., asks if Bessemer steel can be used to make plows of, and whether it can be worked and hardened as other steel. It is claimed that steel manufactured by the Bessemer process can be made with the qualites of receiving and retaining temper. We have seen tools such as cold chisels and turning tools, made of it, but as we never tested them we are unable to say how well they retain temper. We think, however, that this steel would prove admirable for plow shares. It would probably recieve sufficient hardness for that purpose.

J. F. G., of Ohio, says we gave, in a former number of our paper, the following as a recipe for a varnish for lithographs, drawings, etc.: "Dextrine, 2 parts; alcohol, 1 part; water, 6 parts," and asks if it is applicable to oil or canvas paintings. Oil paintings on canvas are seldom varnished, but when so treated for preservation the varnish generally used is mastic.

H. M., of N. J.—"How can I extract acetic acid from pyroligneous acid." The latter may be considered an impure condition of the former. Muspratt's Chemistry or Ure's Dictionary will give you the information as to processes necessary, which it would be inconvenient to transfer to our pages.

Business and Personal.

The charge for insertion under this head is one dollar a line.

Inventors and Patentees wishing to get small, light articles manufactured for them in German Silver or Brass, address Schofield Brothers, Plainville, Mass.

$300 will buy a Patent of A. Grushus, St. Paul, Minn.

Agents wanted everywhere—enormous profits. Sample doz. $1 50. Retail for $3 each. Thomas Powell, Milroy, Ind.

Scale removed from Boilers by Winans' Powder (11 Wall st., N. Y.), 12 years' use proves it reliable an uninjurious.

For Steam and Gas Fitters Tools, Machines for Hand or Power to Screw and Cut-off Gas pipe; stocks, dies, pipe, vises, Peace's adjustable pipe tongs, address Camden Tool and Tube Works Co., Camden, N. J.

Address J. S. Elliott, East Boston, Mass., for best machinery for making lime and sand building blocks.

Good 2d-hand engines, all sizes & styles. A. Logan, Tideoute, Pa.

Manufacturers of Ditching Machines of from three to four feet wide by same depth, address M. White, Jr., New Orleans.

For Improved Lathe Dogs and Machinists' Clamps, address, for Circular, C. W. Le Count, South Norwalk, Conn.

County Rights to the Pew Hat Rack for sale. Address E. S. Blake, Pittsburgh, Pa

For Bosom and Collar Plating Machines, Address W. H. Tolhurst, Troy, N. Y

Bartlett's Reversible Sewing Machines are the cheapest reliable Machines. The Bartlett Machine and Needle Depot is at 569 Broadway, New York.

Wanted—A Tennoning Machine, Sticker, and heavy 36-inch Swing Lathe, either new or second-hand. Address Frey & Sheckler, Bucyrus, Ohio.

Spicer & Phelps, Marshall, Mich., manufacture Horse Hay Forks. Makers of Wooden Pulleys please send them your best terms and prices.

Wanted—A first-class mechanic who has had practical experience in adjusting Shuttle Sewing Machines. He must also understand packing and shipping machines. Business permanent. Address W. G. Wilson & Co., Cleveland, Ohio.

C. B. Manchester, Pawtucket, R.I., has unequalled facilities for manufacturing articles from sheet metal. Inventors and others will find it to their advantage to consult with him in regard to the manufacture and introduction of new inventions.

Four men wanted, with small capital, to sell patents on Commission. A splendid offer. Address J. K. Reiner, Line Lexington, Pa.

Manufacturers of small water pipe please send price list and description to J. C. Burruss, Carrollton, Greene county, Ill.

Sam'l W. Gardiner, Newark, N. J., practical machinist, having a shop of good tools, desires to correspond with those who wish work in this line.

Make your Patents Pay!—J. H. White, Newark, N. J., will make and introduce all kinds of Small Wares in Brass, Tin, and Iron.

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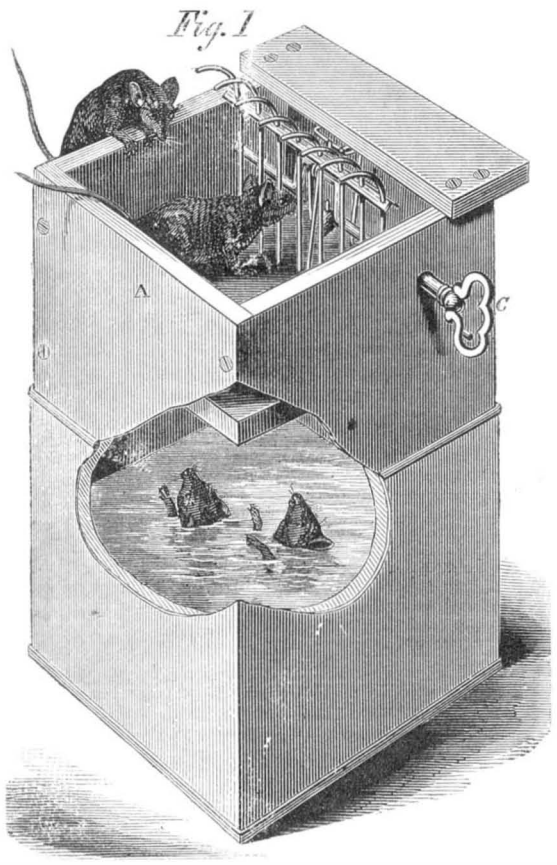
HARLAN'S PATENT ANIMAL TRAP.

It is well known that the fierce and gigantic Norway, or brown rat, is fast increasing in numbers, and while assisting in the extermination of the weaker black, or ordinary rat, is rapidly supplanting that pest by one far worse. This is the case not only at our seaports, and places adjacent, but their incursions reach almost the confines of our continental civilization. It is not improbable, if the story of the Bishop of Treves is true, that this voracious and aggressive variety of rat was the one that swam the Moselle and took possession of his grain-stored castle. Be this as it may, it is certain that



the rat is a nuisance, to be abated only by extermination. But the common traps and other devices contrived for his capture, have proved so defective in plan or inefficient in operation that we are compelled to submit to his ravages without hope of effectually depriving him of his ability for evil, or of offsetting it by a "counter irritant," or something of similar efficiency.

The unique trap shown in the engravings is intended not only for the destruction of rats and mice, but for entrapping other animals, and even for catching fish, for which purpose it may be adapted to the end proposed. The inventor says that by experiments he has found that the true cause why other traps have not proved successful rat catchers is, that when caught the rat becomes excited and angry, and in that state emits a powerful and peculiar odor, that scents the trap and serves as a warning to others. In this, the rat is quickly drowned, and has not time to contaminate the trap with his effluvia.

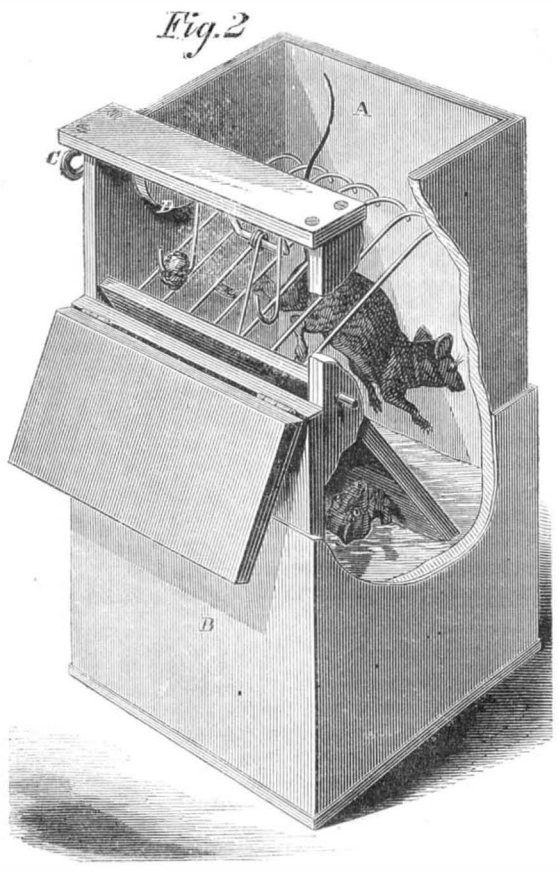
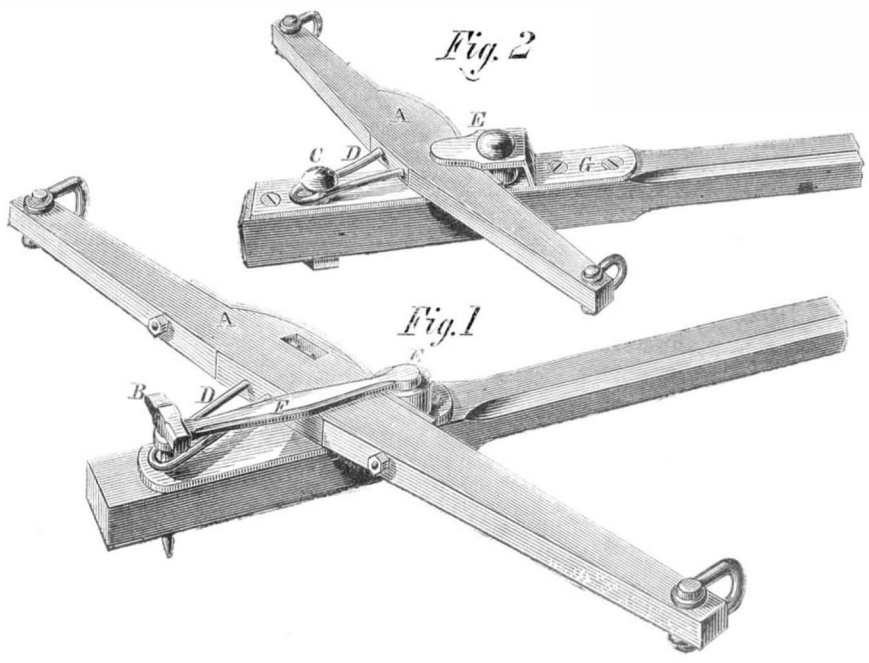


Fig. 1 shows the trap ready set for its game; two rats, seen through the broken side, drowning, and two others in danger of sharing their fate. Fig. 2 is the trap in act of operation, and while one rat is imprisoned in the tank another is about taking his last bath. The trap is self-acting. The upper portion, A, is a box partially open at the top, its floor being hinged. The lower portion, B, is a tank of metal nearly filled with water. To the hinged floor is secured a grille of wires curved at one end. A key, C, winds up a powerful coiled spring held in a box seen at D, Fig. 2, one end of the spring being secured to a crank shaft, and the other to the box. A catch holds the floor in position by means of a wire latch, the two ends of which are hooks for bait. Soon as these hooks are touched, the floor and grille fly downwards, as in Fig. 2, the wires compelling the rat to go with the floor, when they instantly fly back, setting the trap ready for another spring. As the bait is behind the grille, the bars of which are only wide enough to allow the rat's nose to pass between, he cannot steal the bait, but only nibble or touch it, and thus the trap will be always baited as well as set. The spring can be long enough to secure as many operations as the number of rats the tank may hold. The trap will work equally well under water for mink, muskrats, fish, etc.

Patented through the Scientific American Patent Agency, Dec. 24, 1867, by W. H. Davis, assignor to Joseph Harlan, to whom all communications for rights, etc, should be addressed, at Lexington, Scott Co., Ind.

Improvement for Equalizing the Draft of Teams.

The object of the invention shown in the accompanying engravings is to adjust the draft of animals drawings together in harness, so that the weaker animal shall have the longest arm of the lever. It consists in the peculiar form of the double-tree and the method of its attachment to the pole. The center of the front or straight side of the double-tree, A, is formed on a segment of a circle and faced with iron or steel, the center of the circle being represented by the hammer pin, B, Fig. 1, or the ordinary pin, C, Fig. 2. From the center and rear of the double-tree or equalizer projects a long staple, D, or double bar, its sides embracing the pin, B or C; this is so long that under no circumstances shall its end bear against the pin and take any portion of the draft, it being intended only as a guide to the motions of the double-tree. The draft is received on a pin and roller, E. The bar, F, Fig. 1, connects the two pins, the plate, G, Fig. 2, serving the same purpose of keeping the double-tree to the pole. The pin, B, in Fig. 1, is made with a hammer head to serve the purposes of a hammer in emergencies. Its removal and a turning partly round of the bar, F, will permit the double-tree to be taken from the pole. The same result is obtained in that form of the device seen in Fig. 2, by enlarging the spread of the staple, D, where it enters the double-tree, sufficiently to allow the head of the bolt, C, to pass through when the double-tree is thrown back far enough. The two figures show different forms of the same invention, either of which seem well adapted for the object designed.

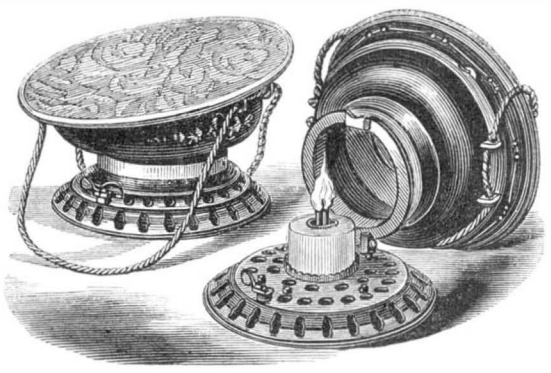


AVERILL & FITCH'S PATENT DRAFT EQUALIZER.

Patented through the Scientific American Patent Agency January 28, 1867. For further information address James Averill, owner of the patent, Champlain, N. Y.

BRUCE'S AMERICAN FOOT STOVE.

Danger of sickness may not always induce the careless to to take trouble enough to protect the feet from cold, but the



inconvenience and uncomfortableness of cold feet will frequently compel that attention which more important considerations fail to exact. Yet clumsy feet clothings are unsightly and ordinary foot stoves inconvenient. That, however, shown in the engraving is elegant in form and decoration, convenient to handle, free from smoke or fumes, safe, and durable. The stand, of open work cast iron, supports a bowl, also of cast iron, which is hinged on one side to the base or stand, and secured when closed, by a catch or latch on the other side. The top of the bowl, neatly carpeted, is inclined to accommodate the natural position of the feet. Attached to a socket in the center of the base is a lamp for burning sperm or kerosene oil or a candle taper. Atmospheric air is furnished for combustion through holes in the base, and an open space between the base and the bottom of the bowl, which do not quite meet, being held apart by small projections or lugs. The top of the bowl is also slightly elevated from its rim by similar appliances, which give opportunity for the escape of whatever gases may be evolved. Directly over the flame of the lamp is a tin disk secured at a little distance from the cap or cover of the bowl—which is a circular cast-iron plate—and serves to radiate the heat of the flame. The top of the cover is concealed by a carpet mat, which adds to the comfort as well as the beauty of the article. The lamp flame, being defended by the sides of the bowl portion, does not flare in being carried about by hand, or in a carriage or sleigh. One of the figures in the engraving shows the stove open, and the other closed. It is carried by slings of worsted or silk cord.

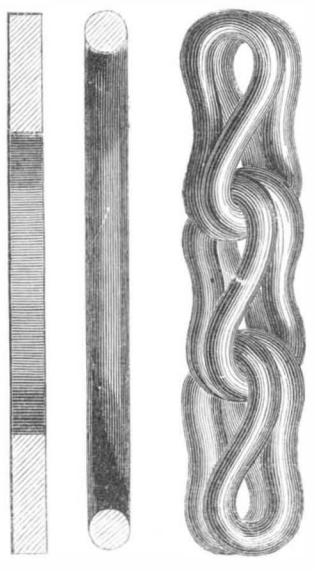
Patent granted Sept. 17 1867, through the Scientific American Patent Agency to N. H. Bruce. Address for the purchase of rights or warmers American Foot Stove Company, Lowell, Mass.

Death of M. Claudet.

We regret to announce the sudden death of M. Claudet, the veteran photographer and distinguished artist. Among the earliest and most successful followers of Daguerre, M Claudet was almost the las to abandon the use of metal plates for the more modern and improved processes of photography, and it was in some degree due to his skill and knowledge that daguerreotype at first made such progress in this country, while the inventor's own countrymen were as eagerly bent upon developing the new art in the direction traced by our Fox Talbot. M. Claudet's nice discrimination and manipulative dexterity gave to the productions of his camera an extraordinary refinement. He was a Fellow of the Royal Society and other learned bodies.—*Mech. Magazine.*

MAKING CHAINS WITHOUT WELDING.

An exceedingly simple method of making chains without welding the links has recently been patented in France, and of which Messrs. Chapman & Boyle, of John street, Adelphi, are the English concessionaires. The sample from which our engraving has been taken was manufactured by taking a disk of the diameter of the flat ring, shown in the cut, and punching a hole in it, so as to leave the ring, just as washers are made. It then measures 5·5 inches in length, 0·51 inches in thickness, the hole being 3·62 inches in diameter, leaving the metal of the ring 0·94 broad. This ring is then rolled by spinning it on outside rolls till it acquires the round bar section—0·59 inches in diameter—shown in the next figure, by which process also the direction of lamination or fiber is modified. The ring is then drawn out into a long hoop, and interlocked with others, as in the engraving. The chain so formed is particularly flexible, though it "kinks" rather more readily than ordinary chains. This however, may be avoided by a slight change in the form to which the links are set. A length of this chain has been laid down in the Seine steam towage navigation. and answers the purpose very well. It will be observed that the strength of each link depends on the strength of two members instead of one, in which—section and quality equal—there is an advantage in point of safety, just as there is in a wire rope composed of strands over a single bar of a section equal to the aggregate of the strands. The invention is one of promise, especially with regard to steel cables, to the manufacture of which the necessity for a weld has always been an insuperable objection. We believe this method of making chains was patented in England several years since.—*Mechanics' Magazine.*



THE Senate has refused to confirm the Hon. W. D. Bishop for the office of Commissioner of Patents.

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VOL. XVIII., No. 9....[NEW SERIES.]....*Twenty-third Year.*

NEW YORK, SATURDAY, FEBRUARY 29, 1868.

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BADLY PLANNED BUILDINGS.

Probably quite a number of the splendid architectural structures in New York city, the exteriors of which arrest the attention by their imposing grandeur and delight the eye by their beauty, are internally monuments of the folly of owner or architect and evidences of a lack of the most necessarily required knowledge, that of adaptation of means to the end. Insufficient supports to floors; improper connection of floors and walls, imperfection of material, sacrifice of utility to elegance, defective water, steam, and gas systems are to be found under circumstances which show that ignorance and sham have been victorious over knowledge and reality.

It is hardly to be supposed that professional architects should be also mechanical engineers, yet large buildings are erected in which steam is used not only for heating, but for working purposes, the details even of the boiler and its appliances being designated by the architect, not always with the happiest results. A case was brought to our notice the other day in which the building—a magnificent edifice—was intended to be heated with steam and a steam engine was to be employed to raise and lower goods through the successive stories. The boiler was amply sufficient, properly set, the engine of good plan and workmanship, yet the boiler would not generate steam sufficient either for heating or hoisting. An examination showed that the flue or chimney, by which the products of combustion were intended to be passed off from the boiler furnace, had an area of only 90 square inches when it should have had at least 400. A larger chimney would have impaired the elegance of the rooms through which it passed, and so utility was sacrificed to appearance. This is not a solitary case and such mistakes, the results undoubtedly of ignorance, are not uncommon, but they are costly.

A few days ago, while in a large wholesale establishment, one of the proprietors, pointing to a crack in his chimney flue which had evidently been plastered over several times, but still defaced the wall of the room, asked what he should do with it. We could only advise an expedient, which he rejected because it would still more, in his opinion, detract from the elegance of the room. When that building burns—as it probably will—the record will be published as "Another Incendiary Fire", or caused by a "defective flue" or 'spontaneous combustion". On the wall where the chimney flue passed was an iron bracket built into the masonry of the chimney, its projection receiving the end of a flooring beam. As the masonry of the chimney became heated it expanded, raising the beam. misplacing the floor, and contracting the wood, which, of course opened a crack through the brick work to the interior of the flue. Temporary plastering availed nothing; the causes were still at work and would produce again the same results. The remedy advised was to give an independent support to the obnoxious flooring beam either by a separate post or by a cross framing between contiguous beams.

It is evident that something more than taste, the gratification of the eye is to be consulted if we desire to make our "palatial marts" anything better than shams valuable mainly for the materials of which they are composed.

THE COMMISSIONER OF PATENTS.

Judge Charles Mason of Iowa was Commissioner of Patents from 1853 to 1857, and inventors and business men well know that his wise administration was a benefaction. He rescued his Bureau from disorder, brought up the work, made new and important rules, and secured uniformity in the actions of the several examiners, settled vexatious questions in Patent law and practice with such wisdom that his decisions are followed as precedents, suggested reforms in the law, established the wholesome system of appeal to the Commissioner in person without any extra fees, and worked fourteen hours a day to accomplish the tasks he imposed on himself. To be sure he was singularly fitted for the office. He was educated at West Point, standing at the head of his class, and after graduating, served as one of the Professors for several years. When he resigned his commission he studied law and became eminent in that profession. His scientific and legal acquirements were of great value to the office and all men look back to his administration with regret that it was interrupted through the action of the notorious Jake Thompson then Secretary of the Interior, and so far as we know, it is the unanimous wish of inventors that he be reinstated.

We hope the President will nominate Judge Mason for the Commissionership and that Congress will not delay confirming him. Politics should not influence either the President or Congress in this appointment. Legal and executive ability are most required after integrity, in filling the Commissioner's chair. Judge Mason possesses all these qualifications to an eminent degree. The interests of inventors and all persons doing business with the Patent Office are suffering for the want of a head. We trust that the President and Congress will agree in this matter and see that the vacancy is immediately filled.

PATENT BILLS BEFORE CONGRESS.

A report of the Congressional proceeding in the House of Representatives on the bills for the relief of Professor C. G. Page, and the heirs of Thomas W. Harvey, the former on his Induction Coil, and the latter for a re-extension of the Screw Machinery patent, is published on another page. The petition of Harvey after some spicy debate was rejected. The application of Dr. Page passed without discussion. This permits the Commissioner of Patents to grant a patent to Dr. Page if satisfied that the applicant was the original inventor of what is known as the "Induction Coil." In other words the length of time since the invention was made and introduced to the public shall not be a bar to the issuing of the patent.

We disapprove of special legislation on patents, but if any one is to be privileged by relief of this kind we are glad Dr. Page is to have the opportunity of proving his claim to an invention which he has stuck to with pertinacity for so many years.

But the thought arises in this connection who is to decide in the Patent Office the claim of Dr. Page to a patent? The bill says the Commissioner of Patents, but will the Commissioner personally examine the evidence or will Dr. Page who is the Chief Examiner in the class under which his invention comes make the examination and report to the Commissioner the result?

CONSUMPTION AND NATURE OF MATERIAL USED IN THE MANUFACTURE OF MATCHES.

The manufacture of those little conveniences, matches, which are valued and cared for at about the same rate as pins, constitute one of the important industrial interests of the country. While nobody thinks of saving a match, but lights one after the other and throws the stick away, deeming it of no more use than the rocket stick after it has served the purpose of guiding the fiery meteor in its sky-ward flight, it is a fact that the demands of the match manufacture are making serious inroads into the supply of clear white pine timber which is needed for other purposes.

As an instance, of the amount of timber consumed by a single establishment, it may be stated that the one owned by Mr. William Gates of Frankfort, N. Y., uses annually 700,000 feet of choice, white pine, making 200,000 gross. The number of persons employed is 300, many of them being children. The amount of sulphur annually used is 100,000 pounds, and of strawboard for boxes 150 tuns. Everything is made on the premises—matches, boxes, packing cases, etc. All of this large amount of matches is consumed in this country, Mr. Gates' trade being principally in the west. The phosphorus used is imported from Europe, and great care is exercised that the employés do not suffer from its deleterious influences. Its affinity for bone, of which it is one of the important constituents, makes it noxious to those persons whose teeth are decayed, the phosphorus attacking the internal portion of the teeth and decomposing the jaw bone, so that sometimes a surgical operation, requiring the removal of a portion of the jaw, is necessary. Choice of persons for employés having perfectly sound teeth and a thorough ventilation of the rooms in which the work is performed are necessary precautions.

HARDENING AND TEMPERING STEEL—THE VALUE OF BATHS.

One of our most valued correspondents, P. McC., of New Jersey, a practical man, speaking of the inquiries and replies regarding the tempering of mill picks, expresses decided doubt as to the assumed advantages of baths or pickles for hardening steel. He says a mill pick should be made light enough to be readily handled, having a short edge to prevent its splitting or bending, and made as hard as the steel will stand; in short, the edge should be thick enough to stand and hard enough to cut. He believes that oil for very light articles and pure water for heavier articles is better than any pickle of salts, etc. Dies for a press, with a hole inside, should be hardened by two streams of water coming from opposite directions and meeting in the hole. By this means the cutting part is made hard and breaking or cracking avoided.

The ideas of our correspondent in relation to the inutility of composite baths, correspond with our experience. There is much bosh written and believed by mechanics on this subject. Verbal directions and instructions for hardening and tempering are of little use. Only the experience and practice of the steel worker, his knowledge of the different qualities of steel and proper methods of working are of real value. We have more faith in the good judgment of an experienced steel forger than in the statements of any theorizer.

PHOSPHORUS.—ITS CHARACTERISTICS.

Phosphorus is one of the most remarkable substances known to science or the arts. It was discovered in 1669 by the alchemist, Brandt, of Hamburg, who found it in the solid constituents left by the evaporation of urine. Thus obtained it was very costly, but for a century it was produced in no other way. In 1769 the Swedish chemists, Gahn and Scheele, found it to be an ingredient of bones and separated it at much less cost than the Brandt process demanded. It has since been found to be an ingredient in the composition of many minerals, its presence in iron ore being a great annoyance to the iron worker, although it may be removed from the ore in the puddling furnace. It is now obtained from bones, which are calcined until they cease to smoke when they are ground to a fine powder and digested with sulphuric acid, one part by weight with twelve parts water. Sulphate of lime is precipitated, while superphosphate of lime remains in solution. Straining and evaporation, perhaps several times repeated, prepares it for the last process, that of distillation. In this process the phosphorus in drops passes from the worm of the retort to a vessel filled with cold water where it congeals.

It may be moulded, by means of a glass tube kept under lukewarm water, into cylinders. The precaution of keeping it under water is necessary from the low atmospheric temperature at which it ignites, it being liable to take fire at only 100° Fah., and is dangerous to handle at any ordinary temperature. When exposed to the air under any circumstances, even at a very low temperature, it undergoes combustion, although slowly, and emits vapors which are luminous in the dark.

Phosphorus combines with oxygen, hydrogen, nitrogen, sulphur, many of the metals, and some of the earths. With oxygen, by combustion, it forms phosphoric acid. In combination with the lime of bones it is well known as a valuable fertilizer under the name of phosphate or superphosphate of lime. In iron ore it causes the production of that quality of iron known as "cold short", which is brittle when cold and malleable when heated. Rubbed in a mortar with iron filings or triturated with particles of other metals phosphorus readily takes fire. Mixed with olive oil in the proportions of one part phosphorus to six of oil, it makes an unguent which is luminous in the dark, but will not burn the flesh if put on the hands or face. By this compound many startling effects may be produced in the way of amusement.

Phosphorus taken into the stomach is a virulent poison, the remedy for which is copious drafts of water with magnesia. Those who work in it, as in the manufacture of matches, are liable to a disease which attacks the jaw bone, producing caries or decay to such an extent as to necessitate sometimes the removal of the bone by a surgical operation. Its use, however, in the manufacture of matches is now generally superseded by other materials as sulphate of potash, etc. Phosphorus is chiefly valuable as a medicine, except where in combination with lime it is a fertilizer. It is singular that while bones contain so large a proportion of this substance as to be the principal source of its supply, shells, as those of the oyster, clam, etc, and coral contain none of it, they being almost pure carbonate of lime. We think also, that the commonly received notion of its abundance in the flesh of fishes is erroneous.

In appearance phosphorus is translucent, slightly yellow, can be cut with the knife, and has a waxy luster.

Scientific and Technical Terms.

MESSRS. EDITORS:—We mechanics who have been limited to a public school education, find great difficulty in reading understandingly many scientific articles contributed to your paper on account of the many mechanical, chemical, and other scientific terms requiring definition. This is suggested to my mind by the complaining remarks of some worthy apprentices to whom I have presented bound volumes of the SCIENTIFIC AMERICAN for the last ten years, and who are desirous of a more full definition than is to be found in Webster or Walker. These definitions, if published in pamphlet form, alphabetically arranged, by your office, and furnished to each subscriber, would make a valuable accessory to the paper and be very acceptable to many subscribers. The small cost of such a pamphlet to each subscriber would be no consideration in view of its value. J. H. I.

[We have no doubt many readers of this paper and of other publications containing articles on scientific subjects find the same difficulty. It is one we studiously endeavor to reduce to the smallest possible amount, by the avoidance, as far as possible, of technicalities and by the adoption of a plain and unpedantic style of writing. It is not, however, always possible to avoid the use of chemical symbols and mathematical abbreviations in articles where chemistry or mathematical problems are the subject. In mechanical descriptions we employ very few purely technical terms, preferring an appearance of lack of experimental knowledge to a display of shop lore which would befog the uninitiated. The proposition for us to compile a glossary of scientific and technical terms could not be entertained; the "pamphlet" would prove to be a mammoth one. We believe there is a book published entitled either "Dictionary of Technical Terms," or "Technical Dictionary," which answers the purpose of our correspondent. The knowledge necessary to understand scientific terms is easily acquired without a collegiate or academical education, and we would recommend apprentices and others to employ some of their leisure hours to this end.—EDS.

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Patent Bills before Congress.

On Friday, February 14th, petitions were presented and discussion was had in the House of Representatives, on the following bills for the relief of inventors and their heirs:

PROFESSOR PAGE'S INDUCTION COIL.

Mr. Myers, of Pa., from the Committee on Patents, reported a bill authorizing the Commissioner of Patents to receive and entertain a renewed application of Charles Grafton Page, of Washington, for letters patent for his induction apparatus and circuit breakers, known as the "induction coil," and if he be found the first inventor thereof to issue a patent, reserving the rights of persons now owning and using such apparatus. After explanation by Mr. Myers and the reading of the report, from which it appeared that the induction coil of Rhumenkorff, for which he was in 1864 awarded the French imperial prize of 50,000 francs, was substantially the invention of Page, exhibited by him in 1839 and 1840, but not patented because he was in the Government employment. The bill was then passed.

HARVEY'S SCREW MACHINERY—APPLICATION FOR RE-EXTENSION.

Mr. Bromwell, of Ill., from the same committee, reported a bill authorizing the Commissioner of Patents to hear the application of the widow and heirs of Thomas W. Harvey for the re-extension of the patent of the 30th of May, 1846, re-issued on the 28th of December, 1858, for an improvement in the machine for cutting screws; and of the patent of the 18th of August, 1846, re-issued on the 4th of January, 1859, for an improvement in the machine for drilling screw heads, the re-extension to be only for the benefit of the widow and legal heirs.

Mr. Farnsworth, of Ill., asked if this was not the same proposition as was before the House last year, and was then defeated?

Mr. Bromwell said that it was.

Mr. Washburn, of Mass., suggested that the patentee had had the benefit of the invention for twenty-one years.

Mr. Van Wyck, of N. Y., remarked that the American Screw Company, which had the use of the patent, had made an enormous dividend.

Mr. Scofield, of Pa., made a plea for the inventor, whom he had known in his youth in Western New York.

The previous question was then moved and seconded.

Mr. Farnsworth moved to lay the bill on the table. The motion was negatived by yeas 43, nays 89.

Mr. Bromwell closed the discussion by an argument in support of the bill, which he assured the House was intended solely for the benefit of the widow and heirs of Harvey. the bill containing an express provision that it should not be valid for the purpose of carrying out any alleged assignment, transfer, arbitration, or award, heretofore had between the heirs and any other person. This provision had been put in the bill because the bill of last Congress was defeated on the sole ground that it would inure to the benefit of the American Screw Company.

Mr. Butler, of Mass., asked Mr. Bromwell whether he would say that there was no understanding between the widow of Harvey and the American Screw Company for the transfer of her interest under the bill?

Mr. Bromwell replied that he did not know what understanding there was between any widow and anybody else. (Laughter.) The widow and heirs would, of course, have the full right to dispose of their interest under the bill.

Mr. Butler stated that his information was that Harvey had entered into a bond of $10,000 with a Massachusetts man to assign the patent to him, but that he subsequently sold it to the Providence Company for $125,000, paying the $10,000 forfeit. That explained why Massachusetts was not in favor of paying any more money by way of royalty to Rhode Island.

Mr. Jenckes, of R. I., denied that the Providence company had obtained the patent for any such consideration.

Mr. Butler said he had his information from a member of the House (Mr. Washburn of Massachusetts), who had himself made the bargain and received the $10,000 forfeit from Harvey.

Mr. Stevens, of Pa., remarked, that while he was a member of the Committee on Ways and Means, that committee investigated this matter for three years, and ascertained that all the inventions of screws had been monopolized by the Providence company, and that an English company, which had been established in the United States for the manufacture of wood screws, had been bought up by the Providence company.

Mr. Washburn, of Mass., opposed the bill, arguing that it was for the benefit of one of the greatest monopolies in the country, and that, without any extension of the patent, it would take at least five years to allow other companies to compete with the American Screw Company.

Mr Van Wyck opposed the bill, and related some facts published in the New York *Evening Post*, showing that the American Screw Company, starting with an original capital of $75,000, had now a capital of $1,000,000, after making dividends estimated at $10,000,000. He asked whether the industry and labor of the country should be any longer taxed to glut such a rich corporation.

Mr. Bromwell said that he knew it was on just such statements that the bill of last Congress was defeated, but that, although notice was given to all the manufacturers of wood screws in the country, no opposition was made before the Committee on Patents to this bill.

Mr. Myers repeated that statement, and protested that the bill was not for the benefit of the American screw Company, rather intimating that the opposition came from that source.

Mr. Boutwell, of Mass., characterized the bill as a proposition to tax the laboring and industrial interests of the country for seven years to the extent of millions of dollars. If the committee believe that the widow and heirs of Harvey were proper objects of national charity, it would be better to report a bill giving them $100,000 or half a million than to pass this bill.

Mr. Butler said that he found from further inquiry that the only mistake in his statement was the assertion that Harvey had paid the forfeit of $10,000. He had not done so.

After some further discussion the House proceeded to vote on the bill, and it was defeated—yeas 58, nays 70.

THERE are several nice schemes before Congress for obtaining extension of patents. One of the applicants for relief (?) admits in his petition that he has made $685,000 already, and that the amount will probably exceed $1,100,000 before the present term of patent expires; and still the heirs of the petitioner plead for a further monopoly! Pray, what amount will satisfy the rapacity of some? Want of space precludes our saying more on this subject this week.

OFFICIAL REPORT OF
PATENTS AND CLAIMS
Issued by the United States Patent Office,

FOR THE WEEK ENDING FEBRUARY 11, 1868.

Reported Officially for the Scientific American.

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees: —

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ *Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to Inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific American, New York.*

74,190.—MACHINE FOR MAKING PAPER TUBES, ETC.—James Arkell (assignor to himself, Benjamin Smith and Adam Smith), Canajoharie, N. Y.

I claim, 1st, The notched and laterally-adjustable paste wheel, F, in combination with the elastic covering, b, on the roller, D, arranged to operate for pasting one edge of the paper, substantially as shown and described.

2d, The curved former I, arranged in relation with the upper tension roller, E, for the purpose of admitting of the folding and pasting of the paper in flat-tube form, as set forth.

3d, The extension rods, J, applied to the former, I, and frame, A, for the purpose of adjusting the former, I, substantially as set forth.

4th, The pressure rollers, h, applied to adjustable bars, K K, and arranged relatively with the former, I, to hold up the edges of the paper sheet preparatory to the turning over or folding of the same, as shown and described.

5th, The adjustable blades, L L, arranged and applied substantially as shown and described in combination with the former, I.

6th, The adjustable blades, n, fitted in swivel brackets, m, in adjustable arms, O, on upright shafts, N N, substantially in the manner as and for the purpose specified.

7th, The securing of the shafts, N, and consequently the bracket arms, O, in proper position by means of the levers, P, and racks, o, arranged substantially as set forth.

8th, The two cylinders, Q Q', provided one, Q, with the grooves, r r' r'' s s, and the cutters, t t, and the other, Q', with the bars, u u' u'', substantially as and for the purpose specified.

9th, The stationary or fixed cutter, R, in combination with the cutter, R', attached to the vibrating plate, S, substantially as and for the purpose set forth.

10th, The loop or guide, Y, attached to the pivoted bars, a' a', which are connected to the plate, S, and arranged to operate in the manner as and for the purpose specified.

74,191.—FINGER BAR FOR HARVESTERS.—J. J. Barnes, Monticello, Ind.

I claim the series of loose friction rollers, 2, in combination with the guards, 1, rod, 4, and finger bar, A, arranged and operating substantially as and for the purposes set forth.

74,192.—WINDOW SASH FASTENER.—Robert Bates, Cohasset, Mass.

I claim, 1st, The combination and arrangement of the standard, D, the fillet, d, and barrel, C', made substantially as described and for the purpose set forth,

2d, The housing, K, cast with the projection, M, substantially as described and for the purpose set forth.

74,193.—BEDSTEAD.—Gottlieb Beurer, Brooklyn, N. Y., assignor to himself and F. Zimmerman.

I claim constructing the sides, A A, with the posts, C C C C, and legs, D D D D, and made in halves as shown and provided with the cross bar, A, combining said halves in combination with the end pieces, B B, constructed in the manner substantially as herein shown and for the purpose described.

74,194.—HARROW.—Mathias Boshenz, Chili, Ill.

I claim, 1st, The bars, c d and y, the lever, J, the upright, K, all constructed and arranged as described and combined with the frame, A, substantially as specified and for the purpose set forth.

2d, The bars, c d and y, the lever, J, the upright, K, combined and arranged as described in combination with the rod, y'', and wheel, R, substantially as described and for the purpose set forth.

3d, The rods, T, in combination with uprights, E combined, arranged and attached as described and for the purpose set forth.

4th, The cutters, F F F F F, attached as described and for the purpose set forth.

74,195.—METHOD OF PREPARING PAPER FOR WRAPPING TOBACCO, SNUFF, SOAP AND OTHER ARTICLES.—Morgan W. Brown, West Farms, N. Y. Antedated January 27, 1868.

I claim a composition of matter as herein substantially set forth and specified and its uses and application to the preparation and treatment of paper, cloth and vegetable fibrous substances, for the uses and purposes herein specified and set forth.

74,196.—HYDRO-CARBON BURNER.—Calvin Carpenter, Jr., Astoria, N. Y., assignor to H. H. Wolcott.

I claim, 1st. The within-described process of burning crude petroleum and separating from it the heavy parts fit for lubricating oil by passing currents of air up through the body of the petroleum to be burned said petroleum being made to float on water, substantially as and for the purposes set forth.

2d, The arrangement of one or more cisterns, B, surrounded by a water jacket, C, and provided with air bonnets, b, below and with pipes, e. to draw off the heavy oil, substantially as herein described.

3d, The arrangement and combination of the slide, i, with the cisterns or cisterns, B, in the burner, A, substantially as and for the purpose set forth.

4th, The arrangement of a rose, j, over each of the cisterns, B, in combination with the air bonnets, b, below, substantially as and for the purpose described.

5th, The escape apertures, g, in the water jacket, C, surrounding the cistern or cisterns, B, substantially as and for the purpose set forth.

74,197.—BELT PUNCH.—James T. Carson, Greensboro, N. C. Antedated January 6, 1868.

I claim the combination belt punch, constructed as described, consisting of the awl, A, having the handle, B, split to receive the knife blade, E, the adjustable hammer, D, carrying the punch, C, with its ears, b, fitting over said handle and pivoted thereto, the spring, f, secured, at d, in the handle, B, and operating the knife blade and punch, substantially as herein set forth for the purpose specified.

74,198.—WAGON BRAKE.—E. M. Chumard, Pittston, Pa.

I claim, 1st, The arrangement of the roller, R, with the arms, n and h, and the brake bar, F, when constructed in the manner substantially as and for the purposes herein specified.

2d, The slide, m, constructed as described and used with the brake bar, F, in the manner substantially as and for the purposes set forth.

74,199.—CORKSCREW.—Seth E. Clapp, Cambridge, assignor to himself and Charles L. Ridgway, Boston, Mass.

I claim the sleeve, E, and stud, F, or their mechanical equivalent, in combination with the jointed corkscrew, B C, substantially as described and for the purpose set forth.

74,200.—FLOUR AND MEAL CHEST.—T. J. Corr, Carlinville, Ill.

I claim the rectangular box, A, with partition, b, and sliding cover, d, by means of grooves, c c, drawers, e e, and inclined hd, f, all constructed and used substantially as and for the purposes set forth.

74,201.—CLOTHES WRINGER.—E. Hall Covel, N. Y. city.

I claim, 1st, The chamber in the upper part of the frame for holding the ball in combination with the cup, h, above the ball, for the purposes herein recited.

2d, The ball, f, made of rubber or some elastic material for forming a spring bearing for the rollers, substantially as described.

3d, The double inclined box, g, for the adjustment of the rollers in combination with the ball, f, as and for the purpose specified.

74,202.—CLEANER FOR DRAWING ROLLERS.—Daniel Crowley, Philadelphia, Pa., assignor to himself and J. Stanley Bruner.

I claim the combination of cleaners, B B, constructed as described with the rollers, A A, substantially as and for the purpose herein specified.

74,203.—LINE FASTENER.—W. P. W. Dana, Newport, R. I.

I claim, 1st, A line fastener in which the griping hook, or its equivalent, is combined with a vibratory arm to which it is pivoted or hinged substantially as described so that the strain of the tightened rope which passes under the hook shall force together the said hook and vibratory arm and cause the rope to be griped and held between them, as set forth.

2d, In combination with an arm or bar capable of a vibratory motion as set forth, the double hook or griper with or without the spring by which said hook is held in position, substantially as herein shown and described

3d, The line fastener herein described in combination with a pulley and pulley block, under the arrangement and for operation as set forth.

74,204.—WATER GAGE.—Clarence Delafield, Factolyville, N. Y.

I claim, The use of a funnel-shaped tube fitted with a valve and combined with the boiler shell substantially as described by which the escape of the steam around the valve steam is stopped and the motion of the float and dial point provided for.

2d, The whistle, a, in combination with the valve stem when said valve is made with a hole through the same leading from and matching with a hole in the valve seat and discharging in the whistle, substantially as described, by which the escape of steam is regulated and made to sound an alarm at a certain stage of the water.

74,205.—MEDICAL COMPOUND.—Charles A. F. Dietz, New York city.

I claim a medical compound, made as herein described.

74,206.—MACHINE FOR GRINDING THE ROLLS OF ROLLING MILLS.—Henry Disston, Philadelphia, Pa.

I claim, 1st, A plate, E, secured to the frame of a rolling mill and having a guide for receiving a traversing slide which carries a grindstone or the grinding wheel to which a rotary motion is imparted, all substantially as and for the purpose herein set forth.

2d, The plate, E, in combination with the within-described devices, or equivalent devices, whereby it can be made to assume different curves, as and for the purpose specified.

74,207.—BRICK MACHINE.—David P. Dobbins and John S. Richards, Erie, Pa., and James Sangster, Buffalo, N. Y.

We claim, 1st, The combination and arrangement of the mechanism for regulating the size of the mold while open consisting of the adjustable strap, S, keys, W X and Y, for holding said strap in position, substantially as herein described.

2d, Also the friction rollers, P, when in combination with and connected directly to the sliding molds, O, as and for the purposes described.

3d, Also the stationary perforated plates or platens, E, in combination with the friction rollers, O, the sliding molds, U, and cam, No. 2, substantially as and for the purposes herein described.

4th, The combination and arrangement of the rods or arms, D' and C', for the purpose of keeping the litters, A', in a vertical position and to prevent the parts from being clogged up while working, substantially as described.

5th, The arrangement of the cams, 1 2 3 and 4, on the wheels, J, so as to produce from one set of wheels and one set of cams on each wheel the alternate reciprocating motions of the sliding molds at opposite ends of the machine, substantially as herein described.

6th, Also the pin, Z, or its equivalent, substantially as herein described.

7th, The arrangement of the frame, N, for supporting the upper gearing and affording a shield to the wheels, J, substantially as herein described.

74,208.—HARVESTER.—Rufus Dutton, New York city.

I claim, 1st, Making the foot board and tool box of harvesters of a single metallic piece when such foot-board at the same time forms a support for the seat spring and seat, substantially as and for the purposes set forth.

2d, Supporting the seat by means of a main spring, Z''', in combination with a spring brace, Z', arranged with respect to each other, substantially as described, both being rigidly attached to the frame or foot-board and at their other ends to the seat and having a short intermediate spring, Z'', between them at their upper ends and free at its lower end, substantially as and for the purposes set forth.

3d, Extending back and upward the rear part of the foot-board to form a support or brace for the main seat spring, substantially as described.

4th, Fastening the foot board and seat springs by one and the same clasp or fastening passing around the axle or axle sleeve of the machine, substantially as set forth.

74,209.—HARVESTER.—Rufus Dutton, New York city.

I claim, 1st, In a harvesting machine having the four sides of the frame constructed of separate parts and rigidly fastened together, making one side of such frame encase and protect all the turning shafts of the machine and another side encase the axle, for the purposes set forth.

2e, In a harvesting machine having a rectangular frame, its several sides being separate pieces and rigidly connected together, making one of the sides of such frame of two or more pieces so that they will not only constitute one of the sides of the frame but will also encase and protect the secondary gearing and pinion and shaft, substantially as and for the purposes set forth.

3d, In a harvesting machine having a rectangular or four-sided frame, its four sides rigidly fastened together making the end of the frame which is supported by the axle of the machine hollow and passing the axle through it, substantially as and for the purposes set forth.

4th, In a two-wheeled harvesting mechine having a hinged finger bar and a loose pole and having the pole hinged to the frame so that the center or axis upon which the pole turns shall be the same with that upon which the frame turns attaching the draft to the front end of such frame and supporting the whiffletree or evener from the pole or shafts by a sliding or yielding support, substantially as and for the purposes set forth.

5th, Constructing the crank wheel fender so that it will be not only a guard for the crank wheel but will also support and keep the end of the connecting rod on the crank pin, substantially as and for the purposes set forth.

6th, Forming the crank fender in two parts which are hinged to and upon each other, substantially as and for the purposes set forth.

7th, The metallic piece, Y, for attaching to and supporting the evener from the pole having flanges on its sides, or their equivalents, and open at the forward end so that the evener can be connected or disconnected without the use of any bolt or pin.

8th, In a machine, having two driving or supporting wheels, and having a loose pole supporting the raker's stand by the pole and behind and below the axle tree, substantially as and for the purpose set forth.

9th, The arrangement and use of the adjusting screw passing through the shifter lever, or equivalent support, and operating upon the end of the bevel wheel shaft, substantially as and for the purposes set forth.

74,210.—HARVESTER.—Rufus Dutton, New York city.

I claim, 1st, In combination with a lever for raising the finger bar, when such lever is forked, or in two parts, at its lower end, so that it will have two points or surfaces to act upon the shoe, the double sheave, VI, attached to the frame of the machine, substantially as and for the purposes set forth.

2d, The use and application of the double sheave, VI, in combination with a lever for raising the finger bar, operating substantially as and for the purposes set forth

3d, In combination with a device for rolling or turning the points of the fingers, so attaching to the machine the hook that holds up the finger bar when folded that such hook shall receive the same motion when the points of the fingers are raised or lowered as is communicated to the shoe, for the purpose set forth.

4th, In combination with the hook that holds the finger bar when folded when such hook is so attached to the machine that it moves with the shoe when the finger bar is turned the application of a spring for holding such hook to the shoe, substantially as and for the purposes set forth.

74,211.—CUTTING APPARATUS FOR HARVESTER.—Rufus Dutton, Brooklyn, N. Y.

I claim, 1st, A knife bar having both its front and back edges depressed so as to form, when combined with the knives or cutters, recesses or openings between the edges of the knife bar and the knives and having its central part recessed or raised longitudinally from the under side, the whole constructed substantially as and for the purposee set forth.

2d, The application and use of the plate, D, arranged and held as described for holding down the front edge of the knife bar, substantially as and for the purposes set forth.

3d, In combination with such plate, D, for holding down the front edge of the knife bar, the button, E, arranged as described, for holding down the back edge of such bar.

74,212.—CUTTING APPARATUS FOR HARVESTERS.—Rufus Dutton, Brooklyn, N. Y.

I claim, 1st, Fastening or securing the leger plate between the finger and finger bar, substantially as described, without the use of a separate rivet, or its equivalent, to fasten such leger plate when the finger bar is raised or turned up on its front edge to a level with the upper surface of the leger plate and so as to form the guard or cross bar for the support of the knives.

2d, Constructing the leger plate so that a part thereof may pass between the finger and finger bar, to hold such plate in position upon the finger, and a part thereof may pass over the knife bar, to act as a button to hold down the front side of such bar, and keep the knives upon the leger plate, substantially as and for the purpose set forth.

3d, In combination with a leger plate, constructed as described in the last claim, recessing the front edge of the finger bar to receive the projecting part of the leger plate, substantially as and for the purposes set forth.

74,213.—CUTTING APPARATUS FOR HARVESTERS.—Rufus Dutton, New York city.

I claim, 1st, Constructing the finger bar of harvesters by curving and raising the front edge above the upper surface of the bar, sufficiently to give room for the knife bar, when placed on the under side of the cutters, and allow open space between such knife bar and the top of the finger bar, for the escape of dirt, grass, etc., substantially as described.

2d, Making the upper edge of the finger bar, when constructed as described in the last claim, form a continuous guard bar in front of the knife bar, substantially as and for the purposes set forth.

3d, In combination with a finger bar constructed as described, the use of a button for holding the knife bar in position, constructed substantially as described, of soft or flexible metal, with a steel or hardened surface, against which the knife bar acts, for the purposes set forth.

74,214.—APPARATUS FOR GRINDING CUTLERY.—Wm. Fosket, Meriden, Ct., assignor to Meriden Cutlery Company.

I claim constructing the matrix in machines for grinding cutlery, substantially in the manner described so that a single and direct movement only required for the matrix to present the blade to the grinding apparatus.

74,215.—CISTERN FILTERS.—Nicolas Ganner and Herman Bader, Cape Girardeau, Mo.

We claim, 1st, A filter, consisting of the parts A, B, C, D, E, F, G, and a, substantially as described.

2d, In combination with the above, the valve, H, faucet, I, and stopper, J, substantially as herein described.

74,216.—MACHINE FOR BEVELING THE EDGES OF SLATES.—Stinson Hagaman, Wiessport, Pa. Antedated Jan. 27, 1868.

I claim, 1st, The beveled grinding wheels, arranged and operating substantially as and for the purpose described.

2d, In combination with the beveled grinding wheels, the guide timbers, E E', arranged substantially as and for the purpose described.

3d, In combination, the drum, B, the belts, D and D', the beveled wheels, C and C' and the guide timbers, E and E', all arranged and operating substantially as described.

74,217.—SMELTING AND DESULPHURIZING IRON ORE.—Alexander Hamer, New York city.

I claim, 1st, The method herein described of desulphurizing both the ore and the fuel in a blast furnace, by the introduction of nearly pure hydrogen, in combination with the blast, as set forth.

2d, The method herein described of desulphurizing both the coal and the iron in a puddling furnace, by means of separate jets of hydrogen, as set forth.

74,218.—WOOD PLANING MACHINE.—David A. Harris, Ithaca, N. Y.

I claim, 1st, The arrangement and construction of the treadle, N, slotted lever, M, and cam, K, on the shaft, L, slide or frame, H, and mandrel in the slide or frame, so that the treadle raises and lets fall the tools on the mandrel, substantially as and for the purposes set forth.

2d, The arrangement and construction of the treadle, N, lever, M, shaft, L, cam, K, slide, H, and its mandrel, in connection with the slotted lever, R, rod, S, angle, T, slide, U, pulleys, W X Y, and two belts changeable by the guides V thereon, for reversing the direction of the revolution of the mandrel and tools, and bringing into action either set of tools at pleasure, substantially as and for the purposes set forth.

3d, The arrangement of the treadle, treadle lever and cam, mandrel, tools, slide, guide rod and belts, in connection with the fixing rod, P, that the changeable belts can be run and not the mandrel, or the mandrel and tools, uniformly and constantly, for any given time, substantially as set forth.

74,219.—HOSE COUPLING.—Charles F. Hartwig (assignor to himself and George R. Kelsey), West Meriden, Ct.

I claim the arrangement of the ring, G, provided with its flange, H, upon the part, A, in combination with the ring, E, constructed so as to operate substantially as set forth.

74,220.—PADLOCK.—Wm. Harvey, Albany, N. Y. Antedated Sept. 12, 1867.

I claim the combination of the pivoted tumblers or bolts, C D, with the spring 1, constructed, arranged and operating substantially as described.

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74,221.—BUTTER DISH.—Westel E. Hawkins (assignor to Simpson, Hall, Miller & Co.), Wallingford, Ct.

I claim the arrangement of the projection, d, upon the bearings, combined with the groove, f, in the knob around the trunnion, so as to operate in the manner substantially as described.

74,222.—WHIFFLETREE HOOK.—W. H. Hawley, Utica, N. Y.

I claim the whiffletree hook, composed of the thimble, A, hook, B, and latch or stop, C, constructed and operating in combination, substantially as described, and for the uses and purposes mentioned.

74,223.—WHIFFLETREE HOOK.—W. H. Hawley, Utica, N. Y.

I claim the whiffletree hook, constructed of the thimble, A, with the curved end, D and E, in combination of the ring, B, and hook, C, all constructed and arranged substantially as described, and for the uses and purposes mentioned.

74,224.—BRUSH HANDLE.—George Hergesheimer (assignor to himself and Cornelius V. Foote). Philadelphia, Pa.

I claim the arrangement of brush bridle, B, with the suction cup, S C, and flanges, F L, constructed and operating in the manner and for the purpose as herein set forth and described.

74,225.—COMPOSITION OF MATTER FOR FORMING ORNAMENTS, ETC.—Eugenius A. Hildreth, Wheeling, W. Va.

I claim, 1st, The method herein described of molding saw dust, or pulverized wood, into shapes and forms that will become hard and strong, that is to say, by mixing the said saw dust or pulverized wood with a solution of sillicate of soda or potassa into a plastic mass, and then molding the same, substantially as described.

2d, The method of immersing or saturating objects molded from saw dust or pulverized wood, and sillicate of soda or potassa, as above described, in a solution of the chloride of magnesium, barium, calcium, ammonium, zinc, iron, lead, or copper, or equivalent decomposing salt, while in a soft or plastic state, substantially as and for the purpose set forth.

3d, As a new article of manufacture, architectural ornaments, and other similar bard substances, composed of saw dust or pulverized wood, cemented together by sillicates, and molded into forms, substantially as herein described.

74,226.—HAY LOADER.—Harvey Hull, West Exeter, N. Y.

I claim a hay-loading wagon, so constructed that the draft horses may travel over the same, and draw it from either end, substantially as described.

74,227.—OPERATING WINDOW SHUTTER.—Sewell E. Jewett, Haverhill, Mass.

I claim, 1st, The peculiar construction of cam, C, especially with reference to the projecting point, J, as shown in fig. 2, when applied to and used for the purpose of opening and closing a window shutter.

2d, In combination with said cam, C, knob, K, interior and exterior escutcheons, E and E', slotted connecting bar, B, vibrating pin, P, and lever plate, L, all operating as specified, and for the purpose as set forth.

74,228.—COOKING STOVE.—John L. Kastendike, Albany, N.Y.

I claim, 1st, The combination of the hot air chamber, B, hot air flues, I i i J m, and valves, l n, with the smoke flues, substantially as set forth.

2d, The axis, P, provided with the triangular plates or "rakers," q q, in combination with the divided frame, N N, arms, y, and lever, z, arranged and operating substantially in the manner and for the purpose specified.

74,229.—MANUFACTURE OF BOOTS AND SHOES.—Wm. Keats and John Keats, Leek, England. Patented in England, April 14, 1863.

We claim the construction of boots, shoes, or other coverings for the feet, with an insole, a welt, and an upper, first stitched together and afterwards stitched or otherwise connected to a bottom or outer sole, substantially as described and illustrated in the drawings.

74,230.—GAS GENERATOR.—Ferdinand King, Richmond, Va., assignor to himself and C. W. Neudecker.

I claim, 1st, The method herein described of producing carburetted hydrogen gas, by introducing dissolved tar, or its equivalent, and steam, into a red hot gas generating retort, substantially as set forth.

2d, The improved gas generator herein described, constructed and operating substantially as set forth.

3d, In an apparatus for generating gas from dissolved tar or other liquid hydrocarbon, in a heated retort, a jet of steam introduced into said retort, to act chemically in modifying the gas generated as described, and mechanically to force the gas from the retort, as set forth.

4th, In combination with the retort, A, and a tar reservoir, the two vessels, D and E, and the pipe, C, constructed and arranged substantially as described, for introducing the dissolved tar into the retort.

74,231.—HAND CORN PLANTER.—J. S. Lawson, Disco, Mich.

I claim a combination of all the principal parts above described, essentially and for the purposes set forth, constituting an entire machine.

74,232.—BAG HOLDING APPARATUS.—J. S. Lehman, Mount Joy, Pa.

I claim the construction of the flanged or slotted jaws, B B, clamping rod, D, and spring, E, with the angular frame, C, in combination with the truck frame, A, all arranged and operating as and for the purpose herein described.

74,233.—MACHINE FOR MAKING WIRE SPRINGS.—David Manuel (assignor to himself and Willard Manuel), Boston, Mass. Antedated Jan. 24, 1868.

I claim the couplings, B and C, with the thimble, D, in combination with frame, A, as and for the purposes specified.

74,234.—DEVICE FOR OBTAINING MOTION BY MEANS OF FRICTION.—Samuel Marden, Newton, Mass.

I claim the wheel, A, with its rim, a, in combination with the lever, D, and the pawl, i, substantially as described.

74,235.—CAR BRAKE.—Samuel Marden, Newton, Mass.

I claim, 1st, The stationary abutment, a, with its spline, f, in combination with the wedge brake, c, with its groove, e, substantially as described.

2d, The levers, C C, in combination with the brake wedge, c, substantially as described.

3d, The wedge brake, c, with its projection or cam brake, d, for the purpose of operating on the periphery of the flange, as well as on the tread of the wheel.

4th, The wedge brake, c, constructed, arranged and operated substantially as described.

74,236.—ICE CUTTER.—George R. Marvin, Keokuk, Iowa.—Antedated Jan. 30, 1868.

I claim the improved ice cutter, formed of a box, A A A', and the cutter, B, with teeth, F, and a hand lever, C, in combination with the toothed ice cutter, B, and stop bars, G G, substantially as and for the purpose set forth.

74,237.—MODE OF FASTENING TEETH.—John A. Mason, Keokuk, Iowa.

I claim the construction of fastenings for artificial teeth, substantially in the manner and for the purposes described.

74,238.—GANG PLOW.—W. W. Mathews, Yates City, Ill.

I claim, 1st, The braces, a a, draught bars, b b, standards, c c, constructed and in combination substantially as shown, for the uses and purposes herein set forth.

2d, The method of raising, lowering and securing the front end of plow beams by means of the levers, e and K, pin r, clevises h h, draught bar i, cog-wheels, m and n n, with their friction rollers, flanges, the lock o, crank lever p, and treadle, q, or by any means substantially the same, all in combination and as shown, for the uses and purposes herein set forth.

74,239.—MACHINE FOR GRADUATING RULES.—Norman Millington, Shaftsbury, Vt.

I claim, 1st, The changeable ratchet, K, arranged and operating substantially as and for the purpose herein set forth.

2d, The gage wheel, M, arranged and operating relatively to the carriage, C, and its connections, substantially as and for the purpose herein specified.

3d, The count wheel, N, having changeable pins, combined and arranged to operate relatively to the gage wheel, M, the graver carriage, C, and to the operating pawl, P, all substantially as and for the purpose herein specified.

4th, The spring, O, arranged and operating relatively to the count wheel, N, the gage wheel, M, and to the carriage, C, or equivalent part, and the motion of which is controlled by the gage wheel, all substantially as and for the purpose herein specified.

5th, The pin, d, on the eccentric strap, D, sliding in the hinged arm, C1, of the graver carriage, C, in combination with the gaging means, M, or its equivalent, adapted to allow the carriage to retreat different distances, all substantially as herein set forth.

6th, The levers, S, mounted and arranged as represented, adapted to support each other by direct contact both at the front and rear, and allowing the tool holders, T, to be adjusted laterally thereon, substantially as herein specified.

7th, The spring, X, pin, x, and hollow adjusting screw, Y, or its equivalent, arranged and operating relatively to the lever, S, and its connections, turning on the cylindrical rod, s, substantially in the manner and for the purpose herein set forth.

8th, Lifting and holding the rule in the path of the gravers by means of the short armed rock shaft, R3 R4 R5, and its connections, constructed, arranged and operating as and for the purpose herein set forth.

9th, The wedge headed bolt, W, operating as represented, relatively to the triangular graver, V, and with the tool holder, T, and its connections, mounted and arranged in the machine substantially as and for the purpose herein specified.

74,240.—CAR BRAKE.—Joseph H. Moore and Joseph E. Cary, Chicago, Ill.

We claim, 1st, The combination of the chain, I, wheel, E, and shaft, H, with the jointed arms, u o, and with an arm or arms, J, all operating substantially in the manner and for the purposes specified.

2d, The combination of the cord, N with the rock shaft, K, with its arms, L and b, and the arms, J, operating substantially in the manner and for the purposes specified.

3d, The combination of the cord, N', and prop, C, with the cord, N, and arm, L, operating substantially in the manner and for the purposes specified.

74,241.—SPRING PUNCH.—Albert U. Noble, Kalamazoo, Mich.

I claim the form and construction of the revolving head, and punches attached, as herein described, in combination with the spring side bars for holding and mounting the same, substantially as herein set forth.

74,242.—COTTON PICKER.—Charles Payne, Brandon, Vt., and Bennet Vandecar, Waterford, N. Y.

We claim, 1st, Removing cotton from the bolls by blowing it off away from the air pipes, in contradistinction to drawing it into the air pipes by suction, substantially as shown.

2d, The combination of a fan, or its equivalent, with elastic or flexible pipes or tubes, E, and a sliding frame, F, to raise or lower their nozzles, substantially as and for the purpose described.

3d, The combination of the rotating spindles, J, in the sliding frame, F, with the nozzles of the pipes, E, substantially as described

4th, The extension, A', of the frame of the machine, in combination with the sliding frame, F, and the bag, N, substantially as described.

5th, The combination of the air pipes, E, of the bag, N, which receives the cotton blown off the stalks of the plants, substantially as described.

74,243.—WEDGE BUCKLE.—Martin W. Pond, Jr., and Alexander T. Ballantine, Titusville, Pa.

We claim as a new article of manufacture, a wedge buckle, consisting substantially of the body, a, wedge plate, b, eccentric clamp, c, and cross bar, d, or its equivalent, when said clamp, c, is so arranged as to compress and guide the wedge plate when closed, and release it when opened, and the wedge plate, b, so arranged as to move in a converging line with relation to the body, a, and to close upon and tighten its hold on the trace or strap as the draught is increased, substantially in the manner and for the purposes set forth.

74,244.—VENT FOR SHEET METAL CANS.—Robert Porter, Philadelphia, Pa.

I claim a sheet metal can provided with an attached vent plug, C, having stays, c' c', fixed to its lower end, so as to prevent the said plug from being detached or entirely withdrawn from its cylindrical tube, b', and at the same time allow of its being elevated sufficiently therein to vent the can, as occasion may require, as described and set forth.

74,245.—WRENCH.—Thomas Pratt, Valparaiso, Ind. Antedated Feb. 5, 1868.

I claim a wrench, in which the jaw, A, is formed by a solid extension of the handle, and the movable jaw, B, is connected therewith by the stem, C, passing through a mortise at the base of the jaw, A, being retained in place by the pressure of the eccentric cam lever and spring, D, upon the side thereof, substantially as set forth.

74,246.—CIGAR.—Charles Quartley, Baltimore, Md.

I claim as a new article of manufacture, the cigar or cigarette having the ends coated with the composition herein described, and providing it with a fulminating compound, as and for the purpose set forth.

74,247.—PRESERVING AND PACKING MEAT.—C. E. Richardson, Cambridge, Mass.

I claim the within described process of preserving animal matter, under high temperatures, from putrefaction.

74,248.—IMPLEMENT FOR CUTTING TOBACCO AND OTHER SUBSTANCES.—Daniel T. Robinson, Boston, Mass

I claim the above described implement for cutting tobacco, consisting of the block or bed, A, post a, lever b, and knife d, the knife being constructed with the slot, e, and provided with the roller, f, or its equivalent, for actuating its movements, and supported within the guide, i, the whole being constructed and operating substantially as herein shown and described.

74,249.—CAP FOR PRESERVE JARS.—S. B. Rowley, Philadelphia, Pa.

I claim a cap for preserve jars consisting of a thin metal plate, formed and corrugated as specified.

74,250.—MEANS FOR STIFFENING ARTICLES OF WEARING APPAREL.—John Sloan (assignor to himself, John H. Jones, and John Given), Philadelphia, Pa.

I claim the stiffener, a b c and a' b' c' d' e', made out of india-rubber, gutta percha, or any equivalent elastic substance, constructed or molded in one piece, in the manner and for the purpose above set forth and described.

74,251.—TILTING WAGON.—Geo. R. Sneath and Charles H. Sneath, Wilmington, Del.

We claim, 1st, The pivots, a a, in combination with the sills, B B, and bent axle, D D D, constructed as described, for the purpose set forth.

2d, Also the lever, L, arranged and constructed as described, for the object already specified.

74,252.—FRUIT FRAME.—Chester Stone, Ravenna, Ohio.

I claim the braces, C D, in combination with the standards, A, and slats, B, when arranged and pivoted together as described, substantially as and for the purpose set forth.

74,253.—WAGON FOR LOADING LOGS, STONE, AND HAY.—James Sutherland, Morris, Ill.

I claim the construction and arrangement of the stationary grooved upright, B, sliding elongated ratchet, C, lever, E, and pawls, b and D, swinging lever, G, and grappling iron, H, in combination with a wagon, substantially in the manner and for the purpose as herein set forth.

74,254.—WATER METER.—John Taggart, Roxbury, assignor to himself and Daniel C. Holder, Dorchester, Mass.

I claim the improved meter consisting of the case, with its induction and eduction passages, and the wheel, arranged as specified, and the air chamber or vessel to open into the case, as set forth.

Also the arrangement of the air chamber or vessel between the wheel case and the case of the registering mechanism.

Also the combination for actuating each of the ratchets, the same consisting not only of a cam or stud applied to a rotary shaft or to a ratchet, but of a lever formed with an inflexible arm, and the other a flexible or bowed spring, to operate as set forth.

Also the combination and arrangement of the stellated indicator, F, with the case, C, and the series of ratchets or rotary measuring wheels, arranged within the case, and provided with mechanism for operating them, substantially as described.

74,255.—CAR FOR TRANSPORTING AND DRYING PEAT.—Daniel E. Teal, Norwich, N. Y.

I claim the carriage consisting of the car constructed as described, provided with wheels attached thereto, by means of the hooks, h, so formed as to embrace and support the cross pieces, a, arranged substantially in the manner set forth and described.

74,256.—ANIMAL TRAP.—A. C. Thomas, Camp Charlotte, O.

I claim the combination of the pitfall, A, and wicker, E, and spring, C, in the manner and for the purpose substantially set forth.

74,257.—PACKING EGGS, ETC.—Abner Thomas, Ulysses, N.Y.

I claim, 1st, The arrangement of coils of wire, somade as to embrace each egg separately, and the fixing the coils of wire, at close intervals to each other, to shelves or partitions, so as virtually to be as described.

2d, The combination with the said coils of wire and shelves or partitions, of cloth, felt, or other padding, on the sides of the shelves next the mouths of the coils of wire, as described.

3d, The combination of the box or case, A, the shelves, C, the coils, H, the padding, E, and cover, B, as described.

74,258.—SLEEVE FOR BRUSHES.—John S. Tilton, Philadelphia, Pa.

I claim a sleeve consisting of a tube or strip of canvas or equivalent material having at its lower edge an annular metal spring, n, as and for the purpose described.

74,259.—ICE CREAM FREEZER.—John Tingley, Philadelphia, Pa.

I claim, 1st, The vessel, E, its dasher spindle, G, and wheel, m, in combination with the outer revolving vessel, C, and the stationary disk or wheel, B, the whole being constructed and arranged for joint action substantially as and for the purpose herein set forth.

2d, The within described dasher, composed arms, p and p', adapted to the spindle, G, and elastic scrapers, s, on spindle shung to the said arms, all substantially as and for the purpose herein set forth.

74,260.—REMOVING INK AND COLORS FROM PRINTED PAPER.—Joseph A. Veazie, Boston, Mass.

I claim the within described saponaceous composition for removing ink or colors from printed paper, and dirt from rags, etc., without injury to the pulp, so that the same can be used repeatedly for the manufacture of white paper, substantially as described.

74,261.—HAND CARD.—R. H. Waite, Hubbardston, Mass.

I claim the combination with the back, A, of the handle, B, in the peculiar manner above described, and as shown in the accompanying drawings, for the purposes stated.

74,262.—BEDSTEAD SLAT.—Otis H. Weed, Charlestown, Mass.

I claim the combination of the spring B, of flat tempered steel, with the slat A, when the spring is constructed with a double curvature, the center resting against the slat, as shown, and arranged to operate substantially as and for the purpose described.

74,263.—BRANDING INSTRUMENT.—Nelson J. Wemmer and John P. Wemmer, Philadelphia, Pa.

We claim, 1st, An adjustable holder constructed for the reception and retention of a plate or other object to be branded, in combination with a stationary branding iron, heated by the apparatus described, or its equivalent, all substantially as set forth.

2d, The adjustable guides, L L, in combination with the plate, K, substantially as and for the purpose specified.

74,264.—ANIMAL TRAP.—Charles Zaiser, Newark, N. J.

I claim, 1st, The elastic or yielding fulcrum, D, in combination with the setting rod or detent, C, substantially as described.

2d, The arrangement of the setting rod, C, loosely in the staple, E, and also in the hole, F, of door, B, substantially as described.

74,265.—DEVICE FOR CONVERTING MOTION.—Wm. H. Abel, Greenville, R. I.

I claim, 1st, The cylinder, A, constructed substantially as shown and described, viz., with annular grooves, m and n, and provided with slides, e, shipper, B, and pin, c, or a tumbling lever, y, or the equivalent thereof, said cylinder or pulley being applied to a central shaft, W, and arranged for operation substantially as and for the purpose or purposes set forth.

2d, The cord or chain, a, applied to the slides, e, and pulley, b, in the manner and for the purpose substantially as specified.

3d, The oscillating lever, C, constructed as shown and described, and arranged for operation substantially in the manner and for the purposes set forth.

4th, The supporting plate, I, and stud, h, made adjustable by means of the slot, K, and nut, g, as and for the purpose substantially as specified.

5th, The adjustable stops, S, secured to the plate, I, as and for the purpose specified.

6th, The combination of the cylinder, A, with the slides, e, and shipper, B, and the cord or chain, a, pulley, b, oscillating lever, C, plate, I, stud, h, and stops, S, all arranged substantially as and for the purpose set forth.

74,266.—KNITTING MACHINE.—Wm. H. Abel, Greenville, R.I.

I claim, 1st, The employment of the stationary bar, g, in the manner and for the purpose set forth.

2d, Liberating and depressing the comb bars, and replacing the same by means of the rod, h, and the spring, i, substantially as and for the purpose specified.

3d, Combining the needles, f, and the selvedge hooks with the jacks, c, in the manner and for the purpose specified.

4th, The combination of the cam, E, roller stud, n, rocking levers, G, pivoted shaft, S, clamp, T, arm, 8, set screw, 9, with the vertical needles, all arranged to operate substantially as and for the purpose set forth.

5th, The combination of all the parts, arranged to operate substantially as and for the purpose set forth.

74,267.—COMBINED PLOW AND ROLLERS.—J. A. Alley, Clifty, Ind.

I claim, 1st, The combination and arrangement of the short rollers, C, frame, A, rigid plow standards, I, and pivoted plow standards, J, with each other, substantially as herein shown and described and for the purpose set forth.

2d, Operating the pivoted plow standards, J, to guide the plows, by means of a lever, O, pivoted to the upper end of one of the said standards, and to a support, P, attached to the frame, A, substantially as herein shown and described.

74,268.—SULKY PLOW.—A. Q. Allis, Dayton, Ohio.

I claim, 1st, The serrated link, B, or its equivalent, for the purposes and substantially as herein described.

2d, The lever and bar, D, or its equivalent, used for the purpose substantially as herein set forth.

3d, The combination and arrangement of the guide bars, F, and the catch and lever, G, for the purpose and substantially as herein set forth.

4th, The combination of the several parts, for the purpose and substantially as herein set forth.

74,269.—STEAM GENERATOR.—V. D. Anderson, Milton, Wis.

I claim the combination and arrangement of the fire box, B, having double walls, a, grate, G, and apertures, d, with the water jacket, J, automatic feeder, D N o m, reservoir, C, alarm, E P r, pipes, L p, water gage, S, and casing A, all constructed and operating substantially as and for the purpose set forth.

74,270.—HOT AIR FURNACE.—Henry Arden, Cincinnati, O.

I claim, 1st, The provision in an air heating furnace, of the annular fire chamber, F, constructed as described, and provided with fuel-feeding passages, L L', substantially as set forth.

2d, The ash pit, B, with sloping sides and central trench, formed and arranged as set forth.

3d, The arrangement of the air heating furnace, A B C D E, fire chamber, F, and imperforate central pier, K, for the purpose explained.

4th, In combination with the foregoing, the annular deflecting plate, H', with the air inlet, H, and hot air chamber, G, as and for the purpose set forth.

5th, The doors, N N, formed and arranged as shown, in combination with the grate, G, and imperforate pier, K, annular fire chamber, F, and draft tubes, Q, as set forth.

74,271.—LAMP.—Alonzo C. Arnold and Ebenezer Blackman, Norwalk, Conn.

We claim the glass chimney, A, formed as herein described, in combination with the arrangements of the vertical springs, D, flat perforated base, G, and cone, B, in the manner substantially as and for the purpose herein set forth.

74,272.—HARVESTER CUTTER.—Jearum Atkins, Mokena, Ill.

I claim, 1st, The U-shaped metal back or knife bar, A, in combination with and for the purpose of holding adjustable or removable cutters for harvesters, as described.

2d, The mode of constructing cutter blades in alternate sections, E and G, dovetailed in the manner described, so that the section, G, acts as a key to hold the adjoining sections, E and F, substantially as described and set forth.

3d, In combination with a U-shaped knife bar, the modes described for fastening the sections by the hook, h, either with or without a pin and screw, substantially as described and set forth.

74,273.—WHIFFLETREE.—Dinsmore Austin, Underhill, Vt., assignor to himself and Homer Rawson.

I claim, 1st, The movable pin, a, in combination with the spiral spring, c, when used as and for the purpose specified.

2d, The spring, C, provided with a flange, 1, and shoulder, x, in combination with the spiral spring, c, when used as and for the purpose set forth.

74,274.—WHIFFLETREE TUG.—Dinsmore Austin, Underhill, assignor to himself and Homer Rawson, Jericho, Vt.

I claim, 1st, The lever, B, pivoted to an arm, D, attached to the end of a swingle tree, and provided with two prongs or hooks, b b, constructed substantially as and for the purposes specified.

2d, The combination of the two-pronged lever, B, with the hollow arm, D, the spring, f, and swingle tree, A, when used as and for the purpose set forth.

74,275.—SHAFT COUPLING.—Dinsmore Austin, Underhill, assignor to himself and Homer Rawson, Chittenden, Vt.

I claim the forked bar, C, in combination with the spiral spring, f, and clip, B, constructed substantially as and used for the purpose specified.

74,276.—BLACKING BOX HOLDER.—Charles R. Bacon, and George D. Clark, Newark, N. J.

We claim a holder for blacking boxes, consisting of the frame, R, lugs, L, clamp or slide, C, and screw, M, when constructed substantially as herein set forth.

74,277.—SAW MILL.—John Baillie, Salem, Ohio.

I claim, 1st, The plane irons, K, bifurcated pitman, D, as arranged, in combination with the beam, C, in the manner and for the purpose substantially as set forth.

2d, The saw, M, as arranged in combination with the beam, C, and radial arm, J in the manner and for the purpose set forth.

3d, The arrangement and combination of the adjustable feed roller, P, link, V, pinions, J T, and stationary roller, P', constructed and operating in the manner substantially as set forth.

74,278.—MACHINE FOR CUTTING ICE.—John Baker, Philadelphia, Pa.

I claim, 1st, A traction engine, carrying and operating saws for cutting ice, substantially as described.

2d, So arranging the saws, E, in connection with the ice-cutting machine, that they may be adjusted vertically, for cutting to a greater or less depth, as may be desired, substantially as set forth.

3d, The swivelled lever-jack, a, located under the body of the machine, in such a position and manner that the machine may be raised and turned thereon, substantially as set forth.

74,279.—HANDLE FOR POCKET CUTLERY.—Stephen Barnes (assignor to self, W. S. Sanford, and John Gardner). New Haven, Conn.

I claim, 1st, The arrangement of the tubes, b, or blocks, a, upon the plate, A, so as to receive the rivets which secure the blades and the two sides of the handle together, substantially as and for the purpose herein set forth.

2d, The introduction of a strengthening wire, d, within the composition of the handle, in the manner described.

74,280.—SKATE.—Philip G. Beckley (assignor to Frederick Stevens), Newark, N. J.

I claim the clamp levers, G G, and H H, in combination with the nuts, I I, and the right and left screw shaft, C, constructed and operating as and for the purpose set forth.

74,281.—APPARATUS FOR WASHING GOLD ORE.—Seth L. Beckwith, San Francisco, Cal.

I claim, 1st, The device for imparting to the pans, E F G, the peculiar swinging motion used for separating metals when only mechanically mixed by banging them to rotating upright crank shafts, in manner substantially as and for the purposes above set forth and described.

2d, The pan, E, provided with a double bottom, whereof the upper one is arched and perforated, and the lower funnel shaped, in manner substantially as above set forth and described.

3d, The pan, F, divided into chambers, substantially as above described the walls whereof are crowned by the overhanging ridges, b, in manner substantially as above set forth and described.

74,282.—POTATO-BAKER.—Charles H. Beeman, 2d, North Fairfax, Vt.

I claim, as a new article of manufacture, a potato-baker, constructed as described, consisting of the upper and lower rims, B B', connected by inclined stands, C, the longitudinal grate bars, A, surrounded by the rim, B' all arranged and operating as described, for the purpose specified.

74,283.—DOOR LOCK.—Jacob Behel, Rockford, Ill.

I claim, 1st, The application of tumblers to the bolt of a lock in such manner that while the bolt can be operated from both sides of the lock case, this bolt can only be unlocked from that side of the case from which it was locked, substantially as described.

2d, Providing a lock with tumblers and an exposed latch lever, so arranged that the bolt can be locked and unlocked from both sides of the lock case and, when desired, so adjusted that it can be locked from either side of the case, but unlocked only from that side of the case from which it was locked substantially as described.

3d, The twin tumblers, D D, applied to a bolt, C, in combination with a latching device, which is so arranged that the tumblers can be connected together or disconnected from each other, at pleasure, substantially as described.

4th, The key guard, G, with its key-studs, i, arranged centrally with respect to the bolt, C, and its twin tumblers, D D, in conjunction with a device which will admit of said tumblers being connected together or disconnected, at pleasure, substantially as described.

5th, The combination of the spring, B1, lever, B2, and hub, J, with the reversible latch, B, constructed and arranged substantially as described.

74,284.—CHILDREN'S CARRIAGE.—Julius Bein and William Ulrich, Newark, N. J.

We claim, 1st, In the children's carriage, the reversible seat and top, constructed substantially as herein specified.

2d, Pivoting the top, E, of a children's carriage, to bars, F F, which are pivoted to the sides of the carriage body, substantially as herein shown and described.

3d, Providing the L-shaped seat, D, of a children's carriage, with pins, c c, which fit into grooves, d, in the sides of the carriage body, substantially as described, so that the seat can be easily reversed, as set forth.

74,285.—CONSTRUCTION OF ICE PITCHER.—William Bellamy, Newark, N. J.

I claim, 1st, The fitting and securing of the bottom, a, to the inner case, B, by a vertical flange, b, fitted within the lower end of the case, and secured thereto by solder, in connection with the hoop, c, fitted on the exterior of the lower end of the case, and soldered thereto, substantially as and for the purpose specified.

2d, The two bases, C D, fitted one within the other, with a space between their upper parts, in combination with the bottom, a, of the inner case, B, resting on C, substantially as and for the purpose set forth.

3d, The combination of the external and internal cases, A B, with bases, f C D, and the bottom, a, of the internal case, B, and the hoop, c, around the lower part of the internal case, B, all constructed and arranged substantially in the manner as and for the purpose specified.

74,286.—FORMING BLOCKS FOR MUFFS.—Ernst W. L. Bellander, Jersey city, N. J.

I claim an expansible muff former, consisting of a series of blocks, arranged as described, and operated by the left and right handscrew and nuts, so as to expand both longitudinally and radially, or either way alone, at will, as set forth.

74,287.—WHIFFLETREE.—L. G. Binkly, Fairview, Ohio.

I claim a whiffletree, constructed of a single bar, A, sliding backward and forward in a socket or coupling, G, and operating against a spring, B, arranged in front of it, substantially as and for the purpose set forth.

74,288.—GREASE OR SIZING.—George Birtwistle, and Robert Birtwistle, Fall River, Mass.

We claim, 1st, The combination of soap and soda-ash, in the proportions above described, for the purposes named.

2d, The use of soap alone, as an agent, when applied to any starch or sizing for the purpose above described.

74,289.—SEWING-MACHINE.—Lyman R. Blake, Boston, Mass. Antedated December 1, 1867.

I claim, in combination with the loop mechanism, containing the work-supporting arm and the feed and stitch-forming mechanism, the guide sleeve, h, arranged and operating substantially as set forth.

74,290.—MACHINE FOR SOLDERING TIN CANS.—John G. Borden, Brewster Station, N. Y.

I claim, 1st, The plate, A, provided with two recesses or reservoirs, a b, for holding the solder and block, C, respectively, substantially as herein shown and described,

2d, The block, C, when made to fit the recess, b, in the plate, A, and when provided with a recess or cavity, d, to receive the edge of the can to be soldered, substantially as herein shown and described.

3d, The arrangement of the recesses, o and e, whereby the cavity, d, in the

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block, C, is connected with the solder reservoir, a, substantially as herein shown and described.

74,291.—RANGE.—D. K. Boswell, Columbus, Ohio.

I claim the herein-described stove, either bricked up in a chimney, or standing out in a room, provided with a portable or movable oven, G, water lining, F, and division plates, H I, all arranged in the manner as and for the purpose substantially as set forth.

74,292.—TOY.—Elijah C. Bracket (assignor to himself and Henry C. Genitsen), Dedham, Mass.

I claim the combination for effecting the motions of the automaton or dancer, the same consisting of the spring, the lever, and the prism, arranged together and with the dancer in manner and to operate as described.

Also, in combination with the spring, the lever, and the prism, arranged together, and with the automaton as explained, one or more wires or springs, I I, and a sonorous helix, K, arranged within the box, and so as to be operated by the prism, in manner and under circumstances as specified.

74,293.—BED BOTTOM.—F. Stanley Bradley, New Haven, Conn.

I claim the combination of the spiral springs with the two bars, L and M, and the cord, K, when the whole is constructed and fitted for use, substantially as herein described and set forth.

74,294.—NECK TIE HOLDER.—Francis H. Brown, Stamford, Conn.

I claim, as a new article of manufacture, a gentleman's neck tie holder, A, constructed substantially as described and so arranged that it can be attached to the neck band or collar of the shirt, either by means of a button secured to the hook itself, or forming the hook without a button, and attaching it to a stud or button affixed to the collar or neck band of the shirt, or to the removeable collar as herein shown and described.

74,295.—MOTIVE POWER.—Isaac W. Brown (assignor to himself and George D. Nettleton), Fair Haven, Conn.

I claim the elastic band, H, in combination with the gearing, substantially as herein described, for the purpose specified.

74,296.—ROW LOCK.—George W. Browne, Brooklyn, N. Y.

I claim the plate, C, and eccentric, D, when combined and operated in the manner and for the purpose described.

74,297.—PATTERN SQUARE.—Nelson W. Burnett, South Hadley, Mass.

I claim the pieces, A and B, forming right angles, in combination with the pieces, a b c, and d, placed at right angles with A and B, and adjustable relatively with each other in slots, in such manner that mortises or tenons may be marked at one adjustment of the tool upon two sides of a right-angled timber, substantially as described.

74,298.—CORN PLANTER.—Edward M. Butz, Allegheny city, Pa.

I claim the combination of the wheels, C D, e, and f, when used in connection with the lever, h, spring, i, and slide, J, the whole being constructed, arranged, combined, and operating as herein described, and for the purpose set forth.

74,299.—SYSTEM OF INDEXING FOR RECORDS.—Abner Campbell (assignor to himself and James Whitehill), Frederick, Md.

I claim the combination of the key, constructed as described, with the index, arranged as specified, for the purpose above set forth.

74,300.—MACHINE FOR OILING WOOL.—Thomas A. Campbell, New York city.

I claim the adjustable plate, P, and rotary brush, B, in combination with each other, and with the hollow cylinder, F, operating substantially as described and for the purposes set forth.

74,301.—PAPER CLIPS.—C. E. Candee, Jersey City, N. J.

I claim the point, G, and the spring, B, in combination with the pin, F, substantially as described.

74,302.—FIELD MARKER.—John M. Canterbury, Mexico, Mo.

I claim the cast metal wheel, B, having a sharp-bevelled perimeter, with square shoulders upon each side, when adjusted upon the spindle, a, by means of the set screw, b, passing through the hub of said wheel, as herein shown and described.

74,303.—AUTOMATIC FAN, TABLE CASTER, AND LAMP STAND.—T. W. Carmichael, Indianapolis, Ind.

I claim the within-described device for operating the fans, N, automatically, in combination with the cruet stand, W, and candle stand, X, all arranged and operating substantially as set forth.

74,304.—STEAK CRUSHER.—A. Castellaw, Chester, Ill.

I claim the steak crusher, constructed as described, consisting of the smooth upper roller, F, and lower corrugated roller, D, operated by the gearing, f, in the frame, the end pieces, C, of which frame are secured together by the plate k, whose center projects downward to form a scraper for the upper roller, F, as herein shown and described.

74,305.—LOCK FOR BARREL HOOPS.—J. Chase, Orange, Mass.

I claim the clasp or plate, A, having the slots, a b, formed as herein described and operating to hold the overlapping ends of the band or hoop, substantially in the manner herein shown and set forth.

74,306.—CORN SHELLER.—P. C. Chipron, Highland, Ill.

1 claim, 1st, The shields, O and P, set in the frame, A, in manner and for the purpose substantially as herein shown and described.

2d, The cradle, B, having the longitudinal bars, b, and sieve, D, and suspended in the frame, A, all as set forth, and operating substantially in manner as and for the purposes described.

74,307.—HAY RAKER AND LOADER.—L. Clarke, Candor, N.Y.

I claim, 1st, The hay-loading apparatus consisting of the belts, F, provided with the teeth, a, and the cylinders, B and C, provided with the arms, b and d, all mounted in a suitable frame, and arranged to operate substantially as described.

2d, In combination with the cylinders, B C, and belts, F, all provided with the arms, as above described, the spring teeth, arranged as set forth.

74,308.—CHILD'S TOY.—Elisha T. Colburn, Boston, Mass.

I claim a figure applied to a ring or hoop, and so constructed that while it will maintain a vertical position thereon, it shall be allowed to move about upon said ring, and at the same time rotate, substantially as described.

74,309.—MACHINE FOR DRESSING STAVES.—Wm. S. Colwell, Pittsburgh, Pa.

I claim, 1st, The arrangement of the arm, u, lever, n, spring, s, lever, C1, provided with arm, D1, and rod, f1, plumber block, P, wheel, A3, feed ram, A1, and weight, w, constructed, arranged, combined, and operating as herein described and for the purpose set forth.

2d, The plumber block, P, provided with the universal or socket joint, X1, said plumber block being used in connection with shaft, i, wheel, A3, and the rack, A2, of the feed ram, A1, as herein described and for the purpose set forth.

3d, Providing the feed ram, A1, with wings, 4, which are opened or spread out by rollers, 18, and contracted by the slides, B2, as herein described and set forth.

4th, Pivoting the dressing head of a stave machine on a line with the vertical plane of the cutting edges of the knives, the whole being constructed, arranged, and operating as herein described and for the purpose set forth.

74,310.—CAST-OFF FOR SEWING MACHINES.—E. M. Comery, Hudson, Mass.

I claim the pivoted collar, a, embracing the needle, in combination with the nose, c, and arm, d, whereby the thread is prevented from passing down between said nose and the needle, as herein shown and described.

74,311.—PHOTOGRAPHIC PRINTING FRAME.—S. F. Conant and H. A. Manley, Skowhegan, Me.

We claim the block, A, in combination with the two clamps, B B, all constructed and arranged substantially in the manner as and for the purpose herein set forth.

74,312.—METALLIC COLUMN.—J. B. Cornell, New York city.

I claim the construction and arrangement with each other of the interior flanged supporting portion, a, and the exterior protecting and ornamental casing, b, substantially in the manner herein set forth.

74,313.—GRAIN SIEVE.—Jacob Corson, Clinton, N. J.

I claim, 1st, A grain sieve consisting of the combination of the adjustable sieves, F G H, with the boards, I and J, all made and operating substantially as herein shown and described.

2d, The above combination with the slide, M, made as set forth.

3d, The arrangement of the arms, B, springs, E E, and lugs, a a, for connecting the box, A, containing the sieves, with the pedestal, C, so that a shaking motion can be easily imparted to the box, A, by hand or otherwise, as set forth.

74,314.—MANUFACTURE OF SHEET IRON.—I. E. Craig, Camden, Ohio. Antedated Jan. 30, 1868.

I claim softening of iron intended to be rolled into sheets by the alloying of iron therewith.

74,315.—BUTTONHOLE CUTTER.—John S. Crane, Lake Village, N. H.

I claim the combination of cutters, C and C', constructed and operating substantially in the manner and for the purpose set forth.

74,316.—HORSE YOKE.—D. K. Croffut, Birmingham, Conn.

I claim, 1st, A solid or continuous hame, constructed so as to slip on over the collar, substantially as and for the purpose specified.

2d, The combination of the yoke, E, with bows, C, provided with the slots, F, substantially as and for the purpose set forth.

74,317.—COMPOUND FOR DESTROYING INSECTS IN TREES.—David Daniels, Fitchburg, Mass.

I claim the compounding of the fish oil and sulphur, substantially as set forth, and the application of the same to the trunks and other parts of fruit and ornamental trees.

74,318.—CLOTHES DRYER.—I. N. Deal, Brooklyn, N. Y.

I claim a clothes dryer, constructed as described, and consisting of the central upright, A, supports, B, arms, a, and hinges or pivots, a1, when the arms, a, are pivoted to opposite sides of the supports, B, and when the hinges a1, connecting each of the said arms, a, to the central post, A, are not in the same vertical line as described and for the purpose specified.

74,319.—MACHINE FOR CROZING BARRELS.—H. De Bus and Geo. Johnson, Cincinnati, Ohio.

We claim, 1st, The cutter head, D, arranged in relation to the adjustable bench, A, raised and lowered by the slide, b, as herein described, for the purpose specified.

2d, The compound vertical slide, E, and horizontal slide, F, the connecting rod, n, the swivels, p p', in which the rod works, and the adjustable slide, H, in the standard, C, combined, arranged, and operating substantially as and for the purpose described.

74,320.—PLASTER AND SEED SOWER.—David Dick and Oliver Preston, Jr., Corning, N. Y. Antedated Feb. 8, 1868.

We claim, 1st, The shaking bar, b, when provided with, e e, and stirrers, i i, in combination with cam wheels, B B, as and for the purpose set forth.

2d, The slide, D, provided with rack, g, in combination with shaft, d, and pinion, a, substantially in the manner and for the purpose specified.

3d, Also, the peculiar gear arrangement, in combination with shaft, m, provided with brushes, shaft, d, pinion, a, and slide, D, substantially in the manner and for the purposes described.

74,321.—PUMP.—Joseph W. Douglas (assignor to W. Douglas and B. Douglas), Middletown, Conn.

I claim the combination of the pump, A, air chamber, C, screw pin, H thimble, F, revolving stand, D, and tubular screw, b, all arranged as described for purpose specified.

74,322.—TRUNK LABEL.—Stephen W. Downey, Piedmont, West Va.

I claim, 1st, Inserting in the body of a trunk, box, or can, a tablet case when the same is provided with a slate, and the whole is constructed and arranged substantially as described.

2d, The spring, H, in combination with a tablet case, when the same is constructed and arranged substantially as described.

3d, The combination of the tablet case and slate, when the former is provided with a sliding top, and the whole is constructed and arranged substantially as described.

74,323.—MARKING GAGE FOR SEWING MACHINES.—Mary A. Duffy, New York city.

I claim, 1st, The combination of tucking plate, A, marking lever, F, presser foot, P, and tucking gage, D, operating together substantially as and for the purposes described.

2d, The combination of plate holder, B, tucking plate, A, marking lever, F, presser foot, P, and tucking gage, D, operating together substantially as and for the purposes explained.

3d, The combination of marking spring lever, F, with tucking plate, A, when the two are constructed, arranged with, and operated by the presser foot, substantially as described.

74,324.—WINDOW-SASH STOP.—Anthony R. Dyett, New York city.

I claim the bolts, C C', in combination with the toggle levers, D D', substantially as and for the purposes specified.

2d, The said toggle levers, in combination with the wedges, E E, or their equivalents, substantially as and for the purposes above described.

3d, The said toggle levers, in combination with the springs, J J', substantially as described.

74,325.—RAILWAY CAR.—G. W. Eddy, Waterford, N. Y.

I claim the construction and arrangement of the extra wheel, C, in connection with the car truck, in such a manner as to admit of its being used as a support and brake, and also as a revolving wheel, in the manner and for the purpose herein described.

74,326.—CORN PLANTER.—Philip Eidmann, Pekin, Ill.

I claim the arrangement of shaft, B, clutches, D D, and cams, I I, with the levers for operating the clutches, with the shaft, G, arms, H H, block, H', and arms, L L, which operate the seed slides, as and for the purpose set forth.

74,327.—PLOW.—Wm. P. Everdon, Leavenworth, Ind.

I claim, 1st, The hollow plowshare adapted to excavate, elevate, and scatter the subsoil without material disturbance of the surface, substantially as set forth.

2d, The provision, upon the outside of a tubular plow, A, of the deflecting plate or guard, E, for the purpose explained.

3d, The provision of the adjustable scoop or excavator, C, at the rear lower portion of the tubular share, A, for the object stated.

74,328.—MACHINE FOR SEWING CARPET LINING.—J. Fales, Walpole, Mass.

I claim, 1st, The combination of the guide rolls, B B2, smoothing plate, H, a sewing mechanism, and feed rolls, C C', all arranged and operating substantially as set forth.

2d, The arrangement of the spring, u, adjusting screw, m, and feed roller, D', as herein described, for the purpose specified.

3d, In combination with a carpet-lining machine, constructed as described, the sewing device, smoothing plate, H, wheels, E F, hammer, d, spring, u, and set screw, m, all arranged and operating as described, for the purpose specified.

74,329.—DUST CUP FOR WATCHES.—Wesley Fenimore, Philadelphia, Pa.

I claim, 1st, A ring, E, rendered adjustable on the ring, D, of the plate, A, in respect to the cap, B, of a watch, substantially as and for the purpose herein set forth.

2d, The ring, E, reduced in diameter so as to penetrate and fit snugly in the opening of the cap, B, and having a shoulder for the said cap to bear against all as set forth.

74,330.—THRASHING MACHINE.—Felix A. Finn, Salt Point, N. Y. Antedated Feb. 6, 1868.

I claim, 1st, The inclined bottom, a, in combination with one or more cylinders, B, provided with, jointed flails, all arranged substantially as and for the purpose specified.

2d, The screen, D, operated by the crank pulley, G and connecting rod, F, from one of the thrashing cylinders, substantially as and for the purpose set forth.

74,331.—CORNETS, ETC.—Isaac Fiske, Worcester, Mass.

I claim so constructing and arranging the passages through the valves, g, and the sections of pipe connected therewith, that a continuous uniform passage is secured through the pipes and valves for both the open and valve tones, said valve and pipe passages being not only uniform in diameter, but free from angles, substantially as shown and described.

Also in combination with the main pipes, r s, the valve cylinder, q, having the two pipes, t u, branching therefrom, and having its valve so arranged that connection may be made through either of said branches, thereby enabling the key of the instrument to the changed without increasing the crooks or detracting from the tone of the instrument.

74,332.—SEPARATING FIBERS FROM WOOD, AND OTHER SUBSTANCES.—Moore R. Fletcher, Cambridgeport, Mass. Antedated Feb. 5, 1868.

I claim, 1st, The process above described, for preparing the fiber of wood, or that of any vegetable fibrous substance, for the manufacture of paper, or any textile material, substantially as specified.

2d, Also subjecting the fibers of wood, or other fibrous vegetable substances, to the action of a very weak solution of alkali, or lime and water, as specified.

3d, Also subjecting the fibers of wood, or other fibrous vegetable matter, when mixed with a weak solution of alkali, or lime and water, to a degree of heat not above the boiling point or below 33° Fah., as specified.

4th, Also subjecting the fibers of wood, or other vegetable fibrous substances, after the same have been subjected to the action of a weak solution of alkali, or lime and water, at a low temperature, until the albuminous, resinous, or nitrogenous matter has been softened, to the action of a high degree of heat and steam pressure, as and for the purpose specified.

5th, Also bleaching vegetable fibrous substances by subjecting the same to the action of a solution of soda-ash and chloride of lime, in the manner substantially as above described.

74,333.—PLANING MACHINE.—Moore R. Fletcher, Cambridge, Mass.

I claim arranging on a revolving cylinder, and on an undeviating line around the surface of said cylinder, one or more series of inclined cutters, so that the cutting edges of said cutters in each series will, as said cylinder revolves, pass through the same space, and stand alternately in opposite directions from each other, but each of them at the same angle from a line parallel with the axis of said cylinder, substantially as described, for the purpose herein specified.

74,334.—COTTON SEED AND CORN PLANTER.—Newton Foster, Palmyra, N. Y.

I claim, 1st, The diaphragm, D, and the bar, G, when made and applied as and for the purpose set forth.

2d, Also the opener, X, when applied to the scraper, R, and used substantially as set forth.

3d, Also the extension of the iron of the scraper, R, by the ends of the roller, T, as and for the purpose set forth.

4th, Also the construction and arrangement of the parallel draft bars, N and N', the bar, O, and upright, P, when held and used substantially as specified.

5th, Also the distributer, K, and annular rim, L, when applied and used in combination with the spindle, F, and diaphragm, D, substantially as set forth.

74,335.—DIE FOR CLOSING BUCKLES.—Merwin Fowler, Wolcottville, Conn.

I claim the dies, constructed as herein described, for closing a three-part buckle, in the manner as set forth.

74,336.—APPARATUS FOR CUTTING AND PASTING PHOTOGRAPHS.—Julius Franke, Quincy, Ill.

I claim, 1st, the box, E, back springs, F, movable platform, H, and pasting frame, combined and operating substantially as and for the purpose described.

2d, The reciprocating card holders or catches, o o', slides, J J', and springs I I', in combination with the platform, H, operating with the board, v, and its strips, w, and the box, E, and springs, F, substantially as and for the purpose described.

3d, The board, v, and movable strip, w, for the purpose described, substantially as specified.

4th, The arrangement of the slides in three or more divisions, so as to hold three or more sets of cards and pictures, substantially in the manner represented and described.

5th, The pulleys, t, belt, u, treadle, t', block, u', and weight, u''', combined and operating as described, substantially in the manner represented as described, and adapted for the purpose specified.

6th, The pin and cutting board constructed of the removable guide board C, frame, B, removable block, D, and pins, b, substantially as described, for the purpose specified.

74,337.—DEVICE FOR TRANSMITTING MOTION.—Eugene Gallagher, Brooklyn, N. Y.

I claim the wheel furnished with radial friction rollers, in combination with the screw or spiral shaft, A, substantially as and for the purpose specified.

74,338.—DITCHING MACHINE.—Wm. Ganse, Greensboro, Ind.

I claim, 1st, The wheel, A, with its periphery, R, Fig. 1, pierced for spades, S S, etc., and working on fixed axle, c, and the wheel or disk, B, with its center to the one side of the center of wheel, A, the difference equal to the greatest projection of the spades, S S, etc., working on same shaft or axle with curved crank, substantially as and for the purposes set forth.

2d, Also the movable spades, S S, etc., arms, n n n, etc., connected with disk or wheel, B, Fig. 1, in such a manner that, as the two wheels, A and B, rotate in the same direction, on a fixed axis on different centers, the spades, S S, etc., recede from the front wheel, A, and project from bottom, top, and rear of said wheel, substantially as and for the purpose set forth.

3d, Also the wheels, H H', in combination with a ditching machine combined and arranged as herein described.

4th, Also the arrangement of the frame, 10, 11, 12, with cross beam, 10, sliding in grooves, 13, 13, in frame, Z W V, supported by axle, 2, and wheels, 1 1', giving a sliding motion to a machine, up or down, and vice versa, to Z W V, substantially as and for the purposes set forth.

5th, Also the hinged and adjustable guide, K K', Fig. 1, in combination with the wheel A.

6th, Also the movable and V-shaped cutter, F, Fig. 1, when combined with a ditching machine, constructed and arranged as herein described.

74,339.—FIRE ALARM.—John F. Gauweiler and Jost Stengel, Croton, Mich.

We claim, 1st, The indicators, b b, numbered or lettered, and operating substantially in the manner set forth.

2d, In combination therewith, loop, e, as and for the purpose described.

3d, The employment of spring lever, h, in combination with loop, e, substantially as specified.

4th, The tank, E, when suspended and operated substantially as described.

74,340.—STUFFING FOR MATTRESSES, SOFAS, AND SEATS.—John M. Gilbert, Troy, N. Y.

I claim stuffing mattresses, cushions, and seats of all descriptions, with hollow elastic blocks or globules, B B, substantially as herein shown and described.

74,341.—MACHINE FOR CUTTING TURF OR SODS.—William Gilbert, Catskill, N. Y.

I claim the knife, C, and shaft, D, with its rollers and knife, e, used with the frame, A, substantially as and for the purpose set forth.

74,342.—HARVESTER.—Alvaro B. Graham, Waukegan, Ill.

I claim the combination, as set forth in a harvester, of the finger beam with the gearing carriage by means of the vibratable link, the draft rod, and swivel joints, M and M1, so that the finger beam may both rise and fall at either end, and rock forward and backward.

Also the combination asset forth, in a harvester, of the finger beam, gearing carriage, vibratable link, draft rod, swivel joints, and arm by which the the rocking of the finger beam is controlled.

Also the combination as set forth, in a harvester, of the gearing carriage, rocking finger beam, vibratable link, reciprocating cutter, crank shaft on the gearing frame, connecting rod (connecting said crankshaft with the cutter on the rocking finger beam), and swivel joint at the cutter.

Also the combination in a harvester of the gearing carriage, finger beam, vibratable link, grain wheel, and lifting connection for the grain end of the finger beam, substantially as set forth.

Also the combination as set forth, in a harvester, of the gearing carriage, finger beam, vibratable link, grain wheel, lifting connection, and lifting connections for the inner or stubble end of the finger beam, so that each end of the finger beam may be raised or lowered relatively to the gearing carriage.

Also the combination of the reel arranged to move with the finger beam, the gearing carriage, radius bar, and two guide-belt pulleys for the driving and slack members of the reel belt, one of said guide pulleys being arranged upon the gearing carriage, and the other upon the radius bar, substantially as set forth.

Also the combination as set forth, of the finger beam, gearing carriage, swivel joint, M, between the finger beams and gearing carriage, raking platform, and hinge connections between the finger beam, and raking platform.

Also the combination of the raking platform, finger beam, hinge connections, gearing carriage, upright stay or link, substantially as set forth.

Also the combination as set forth, of the finger beam with the grain wheel and platform, through the intervention of a hinge connection.

Also the combination of the movable member of the clutch, for throwing the cutter crank out of or into gear with a clutch lever composed of two parts connected by notches, substantially as set forth.

74,343.—ROOFING COMPOSITION.—R. C. Graves, Barnesville, Ohio.

I claim a composition for covering roofs composed of the within described ingredients, substantially in the manner specified.

74,344.—CULTIVATOR.—Thomas Green and Jacob Sommer, Metamora, Ill.

We claim the combination of the adjustable pivoted draft rod, C, and adjustable draft chains, E, with the singletree, D, and with the plow beams, A, pivoted to each other at their forward ends, substantially as herein shown and described and for the purpose set forth.

74,345.—INJECTOR FOR BOILERS.—James Gresham, Manchester, Great Britain, assignor to Ira Dimock, Florence, Mass. Patented in England April 13, 1866.

I claim, 1st, The combination of the steam ram, a, carrying the steam nozzle, b, with a central spindle, d, whereby the steam and water can be adjusted by turning the one handle, d4, substantially as shown and described.

2d, The arrangement of the valve, d5, on the stem, d, in combination with the seat within the steam ram, a, substantially as described.

3d, The valve, f, moving in a cylinder, f2, for a portion of its travel, in combination with the valve, g, and spindle, f1, arranged and operating substantially as set forth.

74,346.—INJECTOR FOR BOILERS.—James Gresham, Manchester, Great Britain, assignor to Ira Dimock, Florence, Mass. Patented in England April 13, 1866.

I claim the arrangement of the rock shaft, g, and forked lever, g2, with relation to the conepiece, e e1 and case, d, all constructed and operating essentially as shown and described, for the purpose set forth.

74,347.—EQUALIZING DOUBLETREE.—Edwin Griswold, Joel B. Cramer, and William Blay, Helena, Montana Territory.

We claim, 1st, An improved doubletree, the end parts, a1, of which are hinged or jointed to the central part, a2, substantially as herein shown and described and for the purpose set forth.

2d, The combination of the strap or straps, E, and pulleys, C, with the draft bar or doubletree, substantially as herein shown and described and for the purpose set forth.

3d, The combination of the rigid or flexible straps, H, with the end parts of a jointed doubletree, and with the straps, E, substantially as herein shown and described and for the purpose set forth.

74,348.—HARROW.—M. W. Gunn, La Salle, Ill.

I claim, 1st, The combination of the adjustable cross bar, C, rocking cross bar, E, adjustable cross bar, D, pin, J, and hook, I, with the pivoted lever, G, and the side bars, A B, as herein described, for the purpose specified.

2d, Adjustably screwing or clamping the forward teeth of the side bars, A and B, in the slotted forward ends of said side bars, substantially as herein shown and described and for the purpose set forth.

74,349.—CLASP FOR HOOP SKIRTS.—James F. J. Gunning, New York City.

I claim a fastening for the ends of skirt hoops, consisting of a slip clasp composed of two sockets, C D, secured on the ends of the hoops, and provided respectively with a lip, a, and a knob or projection, b, all constructed and arranged substantially in the manner as herein shown and described.

74,350.—"TOBACCO HILL PREPARER."—Benjamin T. Hardesty, Sunderlandville, Md.

I claim the combination of the plow, rake, and roller, and the manner in which the roller is attached.

74,351.—HAND LOOM.—Geo. Harsin and T. M. Kirkpatrick, Kirkville, Iowa.

We claim, 1st, The combination and arrangement of the harness frames, H, attached to guide rods, H1, the treadles, F, cams, G, wheel, G', notched bar, E, oscillating arm, C, rod, B, and lathe, A, substantially as described.

2d, The take up mechanism, consisting of the wheel, G', and parts, K7, K6 K5, K4, K3 and K2, arranged substantially as described.

3d, The combination of the reciprocating bar, D, wheel, L, shaft, L', arms, M and N, and picker staff, O, substantially as described.

4th, The arrangement of the yarn roller, I, having a pulley on its end, and the cord, I1, one end being fastened to the frame, and the other to the lever, I2, adjustably held in position by the rack, I3, for the purpose of regulating the tension of the yarn roller, substantially as described.

74,352.—CARPET FASTENER.—Isaac W. Hart and Omer Norton, New Britain, Conn.

We claim the combination of the devices, A and B, for the purpose of a carpet fastener, substantially as herein specified.

74,353.—SPRING BED BOTTOM.—P. J. Harvey, Chicago, Ill.

I claim the combination of the clasps, F, straps, D, and metal plates, C, all constructed and arranged substantially as and for the purpose set forth.

74,354.—CLASP FOR BELT.—E. Hatch, Charlestown, Mass.

I claim my improved belt clasp, composed of the plate, A, (formed with the slots, a a', and the teeth or serrations, e e, &c.,) and the plate or part, B, (provided with the chamber, f, the spring catches, g g,' and stud i i,) the said parts being arranged, constructed, and applied together in manner as set forth, and so as to operate as explained.

74,355.—COLLAR AND BOSOM COMBINED.—E. Hatch, Charlestown, Mass.

I claim the combined collar and bosom, cut or stamped from a single sheet of suitable material, the said bosom being made whole, and the collar being formed and connected therewith, substantially as herein set forth.

74,356.—COMBINED SQUARE AND GAGE.—Thos. C. Hendry, Union Point, Ga.

I claim the combination of gage points, i and 1, with an arm of a common square, by means of a slot, d, and plates, a a, or other equivalent device, substantially as shown and described, and for the purpose specified.

74,357.—CORN PLANTER.—Curran W. Henkle, Washington Court House, Ohio.

I claim, 1st, The metallic box, C, and bottom, c, for the hopper, fitted in the beam, A, the box and bottom being both cast in one piece, and all arranged to operate in the manner substantially as and for the purpose set forth.

2d, The distributing wheel, D, provided with the seed cell, g, and slot or opening, h, all arranged to operate substantially in the manner as and for the purpose set forth.

3d, The cutoff brush, d, applied or secured within the metal bottom, c, to operate in the manner substantially as and for the purpose specified.

74,358.—HORSE RAKE.—Tyson Himmelberger, Heidelberg Township, Pa.

I claim the arrangement of the rake head, A, with the axle, B, connecting rod, M, wheel, J, and its pinion, and the wheel, I, with its handle, the whole operating as and for the purpose herein set forth.

74,359.—LINK JOINT FOR CAR SEAT.—Robert Hitchcock, (assignor to himself, George C. Fisk and Levi O. Hanson,) Springfield, Mass.

I claim a link joint for car seats, in which the end of the link, B, is pinned in a socket, G, the latter having its top and bottom edges tapered each way from a central point in line with the pin, E, substantially as herein shown and described.

74,360.—CHUCK FOR PLANING MACHINE.—John S. Hoar, (assignor to himself, Nathaniel E. Cutler and Charles Hastings,) West Acton, Mass.

I claim the combination of the ledges, m m, and screws, n n, of the plate, B, with such plate and the plate, A, applied together by means, and so as to render one plate capable of being revolved on and clamped to the other, substantially as specified.

Also, the combination, as well as the arrangement, of the adjustable eccentric, D, (or its equivalent,) and the auxiliary clamp plate, C, (having ledges and screws, as set forth,) with the plates, B and A, arranged and applied together, and provided with clamp screws, substantially as hereinbefore explained.

Also, the combination of the ledges, m m, and their screws, with the clamp plate, B, the plate, A, the eccentric, D, and the auxiliary clamp plate, C, the whole being arranged and applied together in manner and so as to operate substantially as hereinbefore described.

74,361.—FRUIT MILL AND PRESS.—Henry Abraham Holderman, North Manchester, Ind.

I claim the two cylinders, D E, fitted one within the other, and the inner cylinder, E, perforated, as shown, in connection with the cap, G, grating cylinder, G x, and the strainer, I, all arranged to operate in the manner substantially as and for the purpose set forth.

74,362.—BEE HIVE.—Isaiah Honeywell, Toledo, Iowa.

I claim the combination of the boxes, A, metallic partition, B, caps, C, cover E, and honey board, D, respectively, constructed and arranged for use substantially as set forth.

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74,363.—WAGON SPRING.—Elijah Horton, Okee, Wis.

I claim, 1st, The stirrup, C, constructed and applied substantially as shown and described, for the purposes set forth.

2d, In combination with the stirrup, C, the rubber spring, D, the cross bars, E, the ties, a and the cups, b, arranged substantially as shown and described, for the purposes specified.

74,364.—CORN SHELLER.—Michael Housman and Simeon Housman, Huntington, Ind.

We claim the shields, A A, in combination with the jaws, B B, and the claws, D D, constructed and operating substantially as and for the purpose herein described.

74,365.—FRUIT MILL.—George S. Hull, Washington, Iowa.

I claim the combination and arrangement of the concave plate, B, the cylinder, A, and the adjustable stirrup, e, substantially as and for the purposes described and set forth.

74,366.—LUBRICATING COMPOUND.—Thomas Hull and Alexander H. Vail, Poughkeepsie, N. Y., assignors to themselves and E. Wright Vail, New York City.

We claim, 1st, The use of white clay with oily matter or materials, to form a lubricating compound, substantially as specified.

2d The combination with white clay, to produce a lubricating compound, of petroleum tar, paraffine, and plumbago, essentially as herein set forth.

74,367.—BUCKLE.—Asa Hurd, Yonkers, N. Y.

I claim, Ist, The combination of the spring, c', with the extension, c', of the clamping tongue, D, substantially as and for the purpose specified.

2d, The frame, A, constructed with its end, a', turned at right angles to its flat portion, a, slotted as shown at a" b', and provided with arms, b, substantially as and for the purpose specified.

74,368.—GAME.—H. Jackson, New York city.

I claim a game, consisting of a box divided into compartments, representing the different departments of the Government, in connection with counters, B, and a pack of cards composed of two kinds, one kind being simply numbered, and the other numbered and named, as designated, in accordance with the compartments in the box, all arranged or devised substantially as herein shown and described.

74,369.—BEE HIVE.—James A. Jackson, Macon, Mich.

I claim the supplemental tops, J, fitted in the spare honey boxes, substantially in the manner as and for the purpose set forth.

74,370.—COMBINED FODDER CUTTER AND CORN HUSKING MACHINE.—Milton C. Jeffers, New York City.

I claim, ist, The cylinder of knives, C, mounted so as to be reversible, in combination with the roller, B, sliding board, G, gearing, I, and husking rollers, H H, as set forth, so that the husking mechanism is disconnected by reversing the cylinder, C, and the hopper covered by the board, G. when the machine is used as a fodder cutter, as specified.

2d, The springs, K, applied to the cap, J, in combination with the inclined husking rollers, H, and pins. b, to facilitate the separation of the husks from the ear, as set forth.

74,371.—WEEDING IMPLEMENT.—C. S. Jewell, Black's Mills, N. J.

I claim, as a new article of manufacture, a weeding implement constructed as described, and consisting of the plate, A, one end, B, of which is curved and flattened, and the opposite extremity, C, forming a chisel, provision being made for the attachment of a strap, D, all set forth.

74,372.—SMOOTHING IRON.—John Jones, Newark, N. J.

I claim one or more screws, in combination with a handle and movable handle frame, as described in this specification, or its equivalent, for the purpose specified.

Also, the smoothing iron with mortises, or its equivalent, in combination with a movable handle, when operated on by one or more screws, as described, and for the purpose specified.

74,373.—REIN HOLDER.—Phineas Jones, Newark, N. J.

I claim the adjustable rein holder or clamp, A B C, adapted to gripe the rein with a lever pressure, when drawn by the hand of the driver, substantially as and for the purposes set forth.

74,374.—PUDDLING FURNACE.—Thos. J. Jones, Scranton, Pa.

I claim the combination of the brick and bosh, as herein described, and used with a furnace, substantially as and for the purposes specified.

74,375.—BURGLAR ALARM.—Albert Kazenmayer and Louis Valois, Newark, N. J.

We claim the combination of the box, L, with its hinged cover, K, and the lever, H, with bolt, A, and spring, all as and for the purpose specified.

74,376.—APPARATUS FOR BORING LINKS.—Charles Kellogg, Detroit, Mich.

I claim the plate, A, bearing a standard stud, D, and provided with an adjustable end rest, B, or its equivalent, and hole, n, all substantially as shown and described, and for the purpose specified.

74,377—MACHINE FOR FORMING EYES ON METAL RODS.—Charles Kellogg, Detroit, Mich.

I claim, 1st, The lever, L, and stud, E, or their equivalents, substantially as shown and described, in combination with the plates, A B C, or their equivalents, and the adjustable guide plate, D, or its equivalent, all constructed, arranged, and operating substantially as and for the purpose set forth.

2d, The lever, M, collar, b, flange roller, N, and the stud, E, or other equivalent device, substantially as shown and described, and for the purpose specified.

3d, The subject matter of the first claim, in combination with the catch, 1 or its equivalent, substantially as shown and described, and for the purpose set forth.

4th, The improved bending apparatus herein described, operating in the manner and for the purpose substantially as set forth.

74,378.—METHOD OF PRESERVING BAIT FOR FISHING.—Theodore D. Kellogg, New York City.

I claim a bait preserver, made and operating substantially as herein shown and described.

74,379.—FENCE.—Michael Kelly, New York city.

I claim, 1st, The thorns, E, produced by dies or otherwise, in the form substantially as represented, and adapted to be secured in place upon a wire by compression laterally both of the thorn and wire, as and for the purposes herein set forth.

2d, Also, the thorns E, and wire, D, combined in the manner represented, and adapted for use in a fence, as herein set forth.

3d, Also, the within-described fence, formed by the combination of the thorny parts, D and E, with suitable posts, C, and with the addition of the large rope, G, adapted for joint operation, as and for the purpose herein specified.

74,380.—CROSS STRAP FOR CARRIAGE.—Henry Killam, New Haven, Conn.

I claim constructing the cross straps for carriages, wholly or in part, of rubber or other elastic material, substantially as and for the purpose described.

74,381.—WORKMEN'S TIME REGISTER.—William A. L. Kirk, Hamilton, Ohio.

I claim, 1st, The cylinder, A, divided into two sets of time compartments, circumferentially and segmentally as described, rotated by the spring, e, from time to time, and provided with a catch lever connected with a clock movement, and working in a ratchet, as and for the purposes specified.

2d, The combination of the cylinder, A, marked with sets of figures corresponding to the hours and to the time compartments within the cylinder, as described, and the movable covers, h k, provided with stop springs, s, and port holes, m m, for indicating the time of a workman's commencing and quitting work, as herein shown and set forth.

74,382.—AXLE FOR VEHICLES.—William Knoch, Allegheny city, Pa.

I claim the tapering spindle, B, constructed as described, fitting eccentrically upon the square shank of the axle, the hole in the front end of said spindle being in its center, and the hole in the inner end placed near the lower edge, in such a manner that the under side of the axle lies parallel with the lower perforated side of the spindle, and an inclined lubricating chamber formed above the axle, as herein described, for the purpose specified.

74,383.—HAND SEED PLANTER.—Hermann Koeller, and Wilhelm Uecke, Camp Point, Ill.

We claim, 1st, The oscillating disk, E, when provided with two or more holes, g h, of different diameters, and when adjustable on the plate, B, having the drop hole, a, so that any desired hole of the disk may be employed for measuring and conveying the charge of grain to the drop hole, substantially as and for the purpose herein shown and described.

2d, The oscillating disk, E, when provided with two or more holes, g h, of different diameters, in combination with the shaft, C, and cranks, c c, hooked rods, f, and oscillating levers, D D, all made and operating substantially as and for the purpose herein shown and described, and in combination with the shovels, G G, made as set forth.

74,384.—DOOR HINGE.—George Lane, New York city.

I claim, 1st. The knuckles, C C', and grooves, D D', when arranged on the door, and its frame, substantially as described, so as to allow the same to be swung open to both sides, as set forth.

2d, The above, in combination with the weight or weights, F F', or their equivalents, made and operating substantially as and for the purpose herein shown and described.

74,385.—TUBE HOLE CUTTER.—Charles H. Lavis (assignor to Philip Farley), Philadelphia, Pa.

I claim the tool, as a whole, when its several parts are combined, constructed, and arranged as set forth.

74,386.—HEATING AND VENTILATING RAILROAD CARS.—Samuel Lloyd, Washington city, D. C.

I claim, 1st, The valve, x, in combination with the heating pipe, b, and the ventilating pipe, c, in the manner set forth.

2d, Heating and ventilating a train of cars by means of a fire proof heating car, containing furnaces, caloric engine, blower agitator, receiver, and pipes arranged and operating substantially as and for the purpose herein set forth.

8d, A flexible connecting pipe, forming a continued hot air flue between cars, and attached to the heating or ventilating pipes, by means of a screw cap at one end, and a sliding tube at the other, in manner and for purpose set forth.

74,387.—BREECH-LOADING FIRE-ARM.—Horace Lord, Hartford, Conn.

I claim, 1st, The employment, in combination with an altered gun barrel (having its rear portion cut out to accommodate a movable breech block), of a reinforce or strengthening band, or external tube, substantially in the manner and for the purpose described.

2d, Also, so arranging the reinforce as to protect the extractor, and lock down the forward end of the breech piece, as specified.

3d, Also forming the reinforce with projecting ears for a leaf-sight, substantially as described.

74,388.—SPRING BED BOTTOM.—Robert O. Lowrey, Saratoga Springs, N. Y.

I claim a bed bottom, c, consisting of a series of independent slats, D, suspended on the stiff springs, B, at the head, and the weaker springs, C, at the bottom, substantially as shown and described.

74,389.—WATER INDICATOR FOR BOILERS.—John D. Lynde, Philadelphia, Pa.

I claim the arrangement of the lever, G, valve stem, F, spring, H, valve, M, pipe, N, with reference to the float, B, whistle, L, and case, A, whereby to sound an alarm when the water is too low in the boiler, and to ascertain the condition of the water at other times, substantially as set forth.

74,390.—MANUFACTURING HARNESS PADS.—John Maclure, Newark, N. J.

I claim, 1st, The revolving table, A, with the adjustable shaft, B, and the projecting jaw, B', substantially as and for the purposes herein shown and described.

2d, The thin middle piece of leather, c', in combination with the pad-plate, F, leather, a', substantially as and for the purposes described.

3d, The former, G, with the groove, h, whereby I am able to stuff the pad by pressure, and cut the leather evenly, for binding, substantially as specified and shown.

4th, Stuffing pads by pressure, whereby I am enabled to obtain an even surface and uniform density in the pad, substantially as described.

5th, In combination with the grooved former, G, the tool, J, substantially as and for the purposes set forth.

6th. Lining the cles, E, either in whole or in part, with india rubber, substantially as described.

74,391.—HARNESS TRIMMING.—Thomas J. Magruder, Marion, Ohio.

I claim, 1st, The rein hook, B, fig. 3, in combination with the center bar, burr plate, B', and screw, a1, or its equivalent, substantially as shown and described, and for the purposes set forth.

2d, The loop, center bar, burr plate, B', in combination with the center bar, a, substantially as shown and described, and for the purposes set forth.

3d, The rein hook, B, fig. 6, in combination with the projection, c, and center bar, a, substantially as shown and described, and for the purposes set forth.

4th, The rein hook, B, fig. 9, in combination with the loop, e, and cross bar, a, and shoulder, s, substantially as shown and described, and for the purposes set forth.

5th, The center bar, burr plate, d', fig. 1, in combination with the terret, D, substantially as shown and described, and for the purposes set forth.

74,392.—HAT.—George Mallory Bridgeport, Conn.

I claim the combination of the brim of a hat with a drooping hoop, so that the brim is caused to droop at the front and the rear, and to rise at the sides substantially as set forth.

74,393.—RAILROAD RAIL COUPLING.—William S. Mallory, Batavia, N. Y.

I claim, 1st, The arrangement and combination of the keys, k, slotted bolts, h and m, and splice pieces, d, in their relation to the rails of a railroad, in the manner and for the purposes herein described.

2d, Also, the combination of the central splice piece, b, with its plate, n, in combination with the rails, a a, the same being held in place and position by means of screws, g, and keys and bolts, in the manner and for the purpose herein described.

74,394.—MACHINE FOR MAKING SEWING-MACHINE NEEDLES.—Eli J. Manville, Waterbury, assignor to himself and E. M. Judd, Wolcottville, Conn.

I claim, 1st, The sliding stock, s, having a hole corresponding to the size of the needle blank, with an adjustable cutter outside said stock, in combination with the revolving spindles, g, arranged as shown, and moved progressively, so as to present the needle blanks successively to the operation of said cutter, while the blank is being revolved as set forth.

2d, The spindle, g, rim, 11, wheel, p, and sliding bevel gears, o, in combination with the springs, s, and grooved cam, 7, (or equivalent mechanism for moving the gears, o,) all arranged in such a manner that the needle blank will be revolved while being turned, and will be held in a fixed position while being grooved and punched, substantially as set forth.

3d, The holding jaws, i, and heads, n, upon the spindles, g, in combination with the sliding blank supplier, q, substantially as and for the purposes set forth.

4th, The general arrangement and combination of the blank supplying slide, q, the spindles, g, the jaws, i, the turning mechanism, the grooving and punching devices, and the means for revolving and for holding the spindles during the respective operations, substantially as set forth.

74,395.—PACKING TOBACCO.—Louis H. Marburg (assignor to himself and C. L. Marburg), Baltimore, Md.

I claim the method of packing tobacco, above described, consisting of the circular elastic band, B, attached to a bag, A, in the manner shown, and operating to close it automatically, substantially as and for the purposes specified.

74,396.—CHURN DASHER.—J. L. Marsh, Richmond, Ind.

I claim a rotary churn-dasher, constructed with the shaft, A, arms, C, teeth, D, and blocks, E, attached thereto by cords, E', said parts being arranged to operate substantially as described.

74,397.—THE REDUCTION OF REFRACTORY IRON ORE.—Chas. Martin, Chancery Lane, England.

I claim the method of reducing refractory iron ores, and of constructing furnaces for such operations, as substantially hereinbefore described and set forth, or any mere modifications thereof.

74,398.—ATTACHMENT FOR PLOW.—William J. Martin, Catawissa, Pa.

I claim, 1st, The sweep or bar, C, attached to the beam, A, and arranged in relation with the mold board, D, substantially as and for the purpose specified.

2d, The adjusting links, c d, and tightening bolt, f, in combination with the sweep or bar, C, and the beam, A, substantially as and for the purpose specified.

3d, The chain or brace, D, arranged in relation with the sweep or bar, C, and the beam, A, substantially as and for the purpose specified.

74,399.—WINDOW AND DOOR BLIND AND AWNING.—G. M. McMahan, Mount Sterling, Ky.

I claim, 1st, The metallic awning herein described, composed of the strips, A A, provided with overlapping flanges and grooves, a a', and hinged to the building, so as to be capable of being lowered and fastened down, so as to form a metallic shutter or blind, for the protection of the doors or windows of the building, substantially as described.

2d, In combination with the foregoing, the catches or locks, m m, cords, I I, roller, D, and crank, E, substantially as and for the purpose specified.

74,400.—MOP WRINGER.—John H. Mears, Oshkosh, Wis.

I claim, 1st, The hinging of the rectangular standards, B B, to the horizontal frame, A A, the hooks, s s, the hinged arms, C C, and the detachable connection at d", when arranged substantially as described, for the purposes set forth.

2d, Also, the hinged arms, C C, the spring lever, D, and the bail, g, when arranged relatively to each other, and to the rollers, E E, standards, B B, frame A A, and treadle, F, as and for the purposes set forth.

74,401.—IMPLEMENT FOR EXTRACTING NAILS.—David Morris Bartlett, Ohio.

I claim the implement herein described, consisting of the jaws, J J', handle, A B, jaws, c c, claws, e e, and the head, H, provided with face, f, the whole constructed and arranged as described, as an article of manufacture.

74,402.—BOBBIN FOR SPINNING.—C. B. Morse, Rhinebeck, N. Y.

I claim packing bobbins by boring holes through them obliquely to the line of their axis, in such a manner that the holes shall intersect the plane of a transverse section of a bobbin at points equidistant from its center, and inserting therein twine, rubber, or other equivalent packing, substantially as and for the purpose herein shown and described.

74,403.—LAMP.—Wm. Mullally, Boston, Mass.

I claim the chimney expansive and elastic base supporter, constructed substantially in manner and so as to operate substantially as described.

Also, the combination as well as arrangement, as explained, of the chimney expansive and elastic base support, and its air passages, with the foraminous or perforated burner body and wick tube.

Also, the combination as well as arrangement of the chimney expansive and elastic base supporter, with the cone or air deflector, the wick tube, and the perforated or foraminous burner body, arranged as represented.

74,404.—STEAM GENERATOR.—J. S. Mullin, Port Monmouth, N. J.

I claim, 1st, The inclined fire tubes, B, and inclined tube sheets, a a, in combination with a steam boiler, substantially as shown and described.

2d, The extension of the smoke stack, or chimney, of a steam boiler, near the bottom of the smoke chamber, substantially as shown and described.

3d, The double deflector, F, whereby the sparks are conducted into the channel, H, substantially as described.

74,405.—HORSE HAY FORK.—Jos. H. Mullin, Schellsburg, Pa.

I claim the combination, substantially as described, of the shank, the loop, E, the slotted sliding bar, and the spring latch, for the purposes set forth.

74,406.—LIGHTNING ROD.—David Munson, Indianapolis, Ind.

I claim, 1st, The lightning conductor, made of sheet copper, tinned on one surface, and formed in flutes or folds, substantially as and for the purpose set forth.

2d, Fastening the sections, A, together, by means of the strap, B, in the manner substantially as set forth.

74,407.—MACHINE FOR BUNDLING KINDLING WOOD.—Frederick Myers, New York city.

I claim, 1st, The grooved, semicircular clamps, G G', constructed as described, pivoted together and to the standards g" at u, and provided with projections, g, pivoted lifter, n', spring, c, and points, b", all operating as described, for the purpose specified.

2d, The grooved semicircular clamps, G G', in combination with the spring cams, E E', substantially as described, for the purpose specified.

3d, The boxes, D, upon the endless belts, B, constructed as described, having the hinged bottoms, d', operated by the catch, a", and arm, b, to permit the fagots to fall between the jaws, G G', constructed and operating substantially as described, for the purpose specified.

4th, The guide, c, having the annular slot, e', in combination with the chute E"', sliding bottom, e" e", angular slotted plate, j, and spring, o, substantially as described, for the purpose specified.

5th, The combination of the rollers, h h, hollow shaft, p, bevelled gears, O X, bevel gears, O' W, the latter upon shaft, w, slotted spindle, m, shaft, t, segmental gear wheel, S, and the wire cutter, f, substantially as described, for the purpose specified.

6th, The plunging disk, i, supported centrally upon the arm, V'", by means of the right angular arm, V" V, and operated through the plate, i, by means of the pivoted spring lever, V', and arm, R, upon shaft, F, constructed to operate as herein described, for the purpose specified.

7th, The door, i'", hinged to the vertical plate, i", and operated by means of the fagot passing between the clamps, G G', under the impulse of the plunger, i, substantially as shown and described.

8th, The lifting lever, n', for lifting the severed end of the fagot wire, n, substantially as shown and described.

9th, The spring, M"", for closing the bottom, d', of the fagot boxes, substantially as shown and described.

74,408.—PORTABLE RAILWAY ELEVATOR.—W. T. Nichols, Rutland, Vt.

I claim, 1st, The construction of the sections, G, of the frame or gang plank, with railway tracks, and with beveled and hinged or jointed ends, as and for the purposes set forth.

2d, The construction of the endless chain, a, of metallic plates with flanges bent at right angles to the upper surface, upon which the platform, F, is fastened, when said links are connected by transverse bolts, which bolts carry wheels upon the outside of the flanges, and gear into the driving wheel, as shown and described.

3d, A portable railway elevator, constructed in sections as described, carrying an endless platform, when the same may be hinged or jointed together and each section operated at a different inclination or plane, or separated, so as to carry a section of said endless platform independently.

4th, The arrangement of separated sections of the elevator, by means of their driving band wheels, C C, pulleys, D D, and rope, E, so as to operate at an angle with each other, as shown and described, and for the purposes set forth.

74,409.—MEAT CUTTER.—Jacob Nacher (assignor to himself and A. Renggly and J. Ulrich), La Crosse, Wis.

I claim, 1st, An automatic machine for cutting or chopping, composed of a block, A, moving backward and forward under the reciprocating knives, I, in combination with the guard, o, and pawls, n, and wheels, a2, by means of which the motion of the same is reversed, substantially as shown and described, and for the purposes set forth.

2d, The pawls, n, in combination with the cross head, H, and wheels, a2, and shaft, L, and pinion, e2, and rack, e, and block, K, substantially as shown and described, and for the purposes set forth.

3d, The lever, s, in combination with the guard, o, and starts, e1, substantially as shown and described, and for the purposes set forth.

4th, The plates, J, in combination with the uprights, B, and knives, I, substantially as shown and described, and for the purposes set forth.

5th, The pawls, n, in combination with the reversible guard, o, and wheels, a2, substantially as shown and described, and for the purposes set forth.

74,410.—STEAM GENERATOR.—William H. Nobles, St. Paul, Minn., and Milton V. Nobles, Elmira, N. Y.

We claim, 1st, The combination of the fan-wheel case, K, and the water chamber, L, as herein described and set forth.

2d, The combination of the water chamber, E, and wheel, G, as herein described and set forth.

3d, The arrangement of the inner and outer cases, K and L, wheel, G, discharge opening, H, flue, F, and chamber, D, whereby to conduct the heat and smoke from the fireplace and back, in one continuous rotating course, substantially as herein set forth.

74,411.—COMBINED SHEEP RACK AND SHELTER.—Omar P. Norris, Fostoria, Ohio.

I claim, 1st, The herein described sheep shed, when constructed in sections, so that it may be taken apart, in the manner as and for the purpose set forth.

2d, The arrangement of the racks, C, and troughs, D, in combination with the shed, A, for the purpose and in the manner substantially as set forth.

74,412.—WINDOW SHADE FIXTURE.—W. A. C. Oaks (assignor to Harbster, Brothers and Company), Reading, Pa.

I claim the combination of the recessed guide plate, A, the zigzag spring, c, and the slide, B, substantially as and for the purpose specified.

74,413.—HANGING WINDOW SASH.—Charles H. Palmer (assignor to himself, Newton Palmer and Joseph Heinrich), New York city.

I claim the combination and arrangement of the flanged sashes, B, the disks, packings, b b, flanged sliding bars, C, weather strips and pivots, a, all constructed and operating as described for the purpose specified.

74,414.—BUGGY-TOP ROLLER.—John Palmer, Mechanicsburg, Pa.

I claim the combination of a gum elastic cylinder, A, and its strap, and buckle, B and C, with the screw bolt, F, and top bows, D, of a falling-top buggy as herein described and for the purposes set forth.

74,415.—BEEHIVE.—Josiah M. Patton, Tipton, Iowa.

I claim the corner posts, b, when grooved their entire length upon two sides, to receive the walls, c c', with a space, a, between them, the outer wall, c, having an external covering, d, secured to it, as herein shown and described.

74,416.—SPINNING THROSTLE.—Oliver Pearl, Lawrence, Mass.

I claim an inverted flyer, provided with a ring, a whirl, and an elongated tubular extension, substantially as described, combined with the spindle and the elongated tubular bearing, as shown, and for the purpose set forth.

74,417.—MODE OF CULTIVATING GRAPE VINES.—Geo. Perry, Georgetown, Conn.

I claim the herein described mode or system of cultivating vines and removing the oldest roots, so as to preserve a vigorous and healthy growth, with new roots, for an indefinite period of time.

74,418.—FIRE AND BUGLAR ALARM.—O. E. Pickett, North Auburn, and R. S. Luce, Lawsville Centre, Pa.

We claim, 1st, The set, h, the lever trigger, g, and the trip rod, e, combined with the escapement, c, the hammer, d, the bell, B, the wheel, b, and the spring, o, when arranged and operating as and for the purpose described.

2d, In combination with the alarm device, the rawl, m, the igniting plate, C, the spring, s, and the match holder, n, provided with the spring, p, arranged and operating as and for the purpose set forth.

74,419.—CULINARY BOILER.—O. Poole, Detroit, Mich.

I claim, in combination with the boiler, A, perforated baskets, D, E and F, and removable partitions, C and G, the spout, H, constructed and arranged substantially as herein described and for the purpose set forth.

74,420.—POTATO WASHER.—E. N. Porter and P. P. Roberts, Morrisville, Vt.

We claim the vertical potato washer, E, rotating in a pail with flanges, B, on the inside, when constructed and combined as herein described and for the purposes set forth.

74,421.—SKATE.—John W. Post, Castile, N. Y.

I claim, 1st, The heel fastening, consisting of the lever, pivoted on a sleeve, d, and made adjustable by means of the set screw, F, substantially as described.

2d, The pivoted lever, G, having a serrated rear face, and secured to the foot plate, H, substantially as set forth.

3d, The device for adjusting the pivoted lever, G', consisting of the sleeve, d, moved by the set screw, F, provided with a shoulder, f, which has its bearings in the cross slot of the slot, e, in the bracket, E, substantially as described.

4th, The clamps, L, provided with spurs, k, in combination with the partly serrated slots, K, substantially as and for the purposes described.

5th, The V-shaped cut, j, in the standard, C, and the correspondingly shaped bracket, I, substantially as and for the purposes set forth.

74,422.—FIFTH WHEEL FOR CARRIAGES.—Hiram W. Ransom, Lawrenceburg, Ind.

I claim the block, H, which forms a bearing for the fifth wheel, F, and which is provided with a wing on each side, whereby the rubber, D, is held in the safety guard, G, as and for the purposes set forth.

74,423.—CURRY COMB.—B. W. Remington, Providence, R. I.

I claim the plate, A, as applied to a curry comb, and forming a dirt receiver, substantially as described, and for the purpose set forth.

Also, the plate, B, in connection with A, for preventing the dirt from falling back after passing through the slot into the receiver, all substantially as described and for the purpose specified.

74,424.—SPRING FOR VEHICLES.—C. L. Rice, Dunmore, Pa.

I claim the combination of the side springs, E, whose lower ends are hinged at a to each side of the reach, and whose upper curved ends are hinged to the sides of the wagon body, and the spring, F, whose inner end is secured to reach between the springs, E, and whose forward end passes through the springs, D, and is bent over and hinged to the forward edge of the upper part of said spring, all arranged and operating as described, to prevent the longitudinal and lateral movements of the body, as herein set forth.

74,425.—MACHINE FOR BUNDLING KINDLING WOOD.—John Richardson, New York city.

I claim, 1st, The carrier belt, A, in combination with the belt, B, mounted in the hinged or pivoted frame, when arranged to operate substantially as described, for the purpose of feeding the wood to the receiver, E, as set forth.

2d, The plates, 1, 2, 3, so arranged within the receiver, E, to receive the wood, said plates being arranged to yield as the wood is fed in, substantially as described.

3d, The sliding section or slide, a, arranged to close the aperture through which the wood is fed into the receiver, E, and automatically to open the same, as the plunger is drawn back, when constructed substantially as herein shown and described.

74,426.—SNAP HOOK.—I.C. Richmond (assignor to H.C. Hull), West Meriden, Conn.

I claim the combination of the two parts, A and B, pivoted and joined together in the manner described, and so as to open by turning one part from the other, to the right or left, as the case may be, as set forth and specified.

74,427.—STRAP RING FOR FIRE-ARMS.—J. Rider, Newark, Ohio, assignor to himself and E. Remington & Sons, Ilion, N. Y.

I claim uniting a swivel bow to the guard strap or band, by means of the lug and pin, substantially as described.

74,428.—BREECH-LOADING FIRE-ARM.—J. Rider, Newark, Ohio assignor to himself and E. Remington & Sons, Ilion, N. Y.

I claim, 1st, In combination with the spring, i, the groove and abutment, 5, across the groove, so that, when the breech block is replaced, after having been taken out of the arm, said spring will find its place in connection with the breech block, and go into action with it, without any care or attention on the part of the user, substantially as described.

2d, Also, hanging the hammer on the two centers, h and i, so that it can move at times on one, and at times, on the other, as and for the purpose described.

3d, Also, the arranging of the pivot, i, in a line in rear of a vertical line drawn through the pivot bolt, h, so that the hammer can cause the brace to follow it in moving back without being rigidly connected to it, substantially as described.

4th, Also, in combination with the hammer and the brace, the dog, n, connected and acting therewith, substantially in the manner described.

5th, Also, the button, t, made and operating in connection with the pivot bolt heads, as and for the purpose described.

74,429.—PINEAPPLE BEER.—Geronimo Rivera, Cambridgeport, Mass.

I claim the beverage, made and prepared essentially as above described, and which I term pineapple beer.

74,430.—CEMENT ROOFING.—Leander Rodney, New York city. Antedated Jan. 31, 1868.

I claim, 1st, The application of strips of wood, or other suitable material, placed edgeways on the rafters or other support on which the roof rests, these strips, of any desired thickness, being properly secured and fastened together, and this foundation serves as a body on which to apply water-proof cement, or other suitable material, substantially as and for the purpose herein specified.

2d, The application of cement, or other suitable material, to two or more sheets of paper, or other suitable material, to be used in connection with the foundation, as above described, or any other suitable foundation, or separately, substantially as and for the purpose herein specified.

74,431.—PUMP.—Chas. Rogers, Allegheny City, Pa.

I claim the levers, A A, pivoted to a brake, S, of a hand pump, said levers being supported at their outside ends, each by a vibrating link, L, the whole being combined and arranged to operate with respect to the pump box and its attachments, substantially as described.

74,432.—SAWING MACHINE.—Clark Root and Bishop Bennett, De Ruyter, N. Y.

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We claim the three-armed lever, B, swinging fulcrum, f. and driving devices, K I I I H, all constructed and arranged as herein described and for the purpose set forth.

74,433.—SCHOOL DESK AND SEAT.—J. P. Scott and S. H. La Rue, Lewisburg, Pa.

We claim, 1st, The combination of the grooved support, A, slotted guides, B, desk, C, hinged leg, G, brace, J, vertically sliding support, K, seat, L, brace, M, and crank, N, all constructed and arranged as described for the purpose specified.

2d, The jointed seat brace, M N, formed by the combination of the pivoted bar, M, and pivoted bar or crank, N, in combination with the seat, L, and seat uprights, K, substantially as herein shown and described, and for the purpose set forth.

3d, The pivoted and sliding self-locking jointed brace, J, in combination with the leaf, G, and book box, C, substantially as herein shown and described and for the purpose set forth.

74,434.—PIVOTED STUMP JOINT.—Anson Searls, New York city.

I claim an improved stump joint, substantially as described, and for the purposes set forth.

74,435.—WHIP TIP.—C. R. Shelton, New Haven, Conn.

I claim a whip tip provided with a socket, B, so as to be attached to the stock proper, in the manner herein set forth.

74,436.—NECK TIE.—Jacob Silbermann and Gustav Unger (assignors to themselves and Jacob Heinemann), New York city.

We claim a neck tie formed in one piece by weaving with the end portion diverging from and wider than the middle portion of the article, as set forth.

74,437.—HAND TURNING TOOL.—Amos B. Simonds, Youngstown, Ohio.

I claim the screw bolt, C, provided with a projection, a, in combination with the socket, B, collar, F, cutter, E, and handle, A, all constructed, arranged, and operating substantially as described and for the purpose specified.

74,438.—POTATO DIGGER.—E. Smith, West Milton, N. Y.

I claim the revolving riddle, r, in combination with the endless platform, l, and scoop, f, the whole constructed and operating as and for the purposes specified.

74,439.—CLOTH RACK.—H. C. Smith, D. A. Kelly and James E. Murdoch, Jr., Clarksville, Ohio.

We claim the cloth rack constructed of frame posts, A, and horns, e, in combination with the spindles, a, casters, b, and step, m, all substantially as shown and described and for the purposes set forth.

74,440.—AUTOMATIC CUT-OFF GAS BURNER.—John B. Smith, Pittston, Pa.

I claim, 1st, The rod, f, so arranged as to automatically cut off the flow of gas, substantially in the manner herein set forth.

2d, In combination with the above, lever, K, substantially as and for the purpose set forth.

3d, Stem, a, in combination with lever, K, substantially in the manner specified.

4th, Also, pipe, A, provided with bulb, B, or any equivalent device, in combination with stem, d, lever, K, and rod, f, substantially as and for the purpose described.

74,441.—CULTIVATOR.—Joseph Snyder, Rock Lick, W. Va.

I claim the cultivator constructed with the curved main beam, A, and curved supplementni beam, B, shares, c d, handles, C, and braces, f g and m, the whole arranged substantially as and for the purpose specified.

74,442.—HIGH AND LOW WATER ALARM FOR STEAM GENERATORS.—Joseph H. Springer, Philadelphia, Pa.

I claim, 1st, The employment of two unequal weights suspended by cords or rods of unequal lengths to a lever with its fulcrum at its center arranged inside of a cylinder attached to the outside of a steam boiler said weights being subject to the action of high and low water, substantially as and for the purpose set forth.

2d, In combination with the above the levers, g g', arranged within a cylinder outside of the boiler, substantially as and for the purpose specified.

3d, Arranging the safety valve within the hollow cap, D, substantially as and for the purpose specified.

4to, The glass gage, G, when used in combination with cylinder, A, and weights, B B, substantially as set forth.

74,443.—GIG FOR CLOTH.—O. M. Stillman, Westerly, R. I.

I claim, 1st, The combination and arrangement of the cross bands, o o', reverse driving pulleys, p p1, counter pulleys, p2 p3, adjusting board, w, shaft, q, tubular shaft, s, bevel wheels, t t'r, as herein described for the purpose specified.

2d, The arrangement of the cylinder, A, rollers, c, racks, i, pinions, j, shaft, z, worm wheels, x, rollers, m n n', reversible cloth beams, b b', and gear wheels, d d1 d2 d3, as herein described for the purpose specified.

74,444.—STOVE FLUE SUPPORTER.—Andrew J. Stover, Sandyville, Iowa.

I claim the plate, A, the segments, b b, the bolts, d, and washer plates, g, the whole combined and operating as and for the purpose herein described.

74,445.—HOISTING DRUM.—Henry Strickler, Carlisle, Pa.

I claim the combination with the vertical shaft, A, the loose drum, D, working thereon, the pawl, a, and brake, g, both pivoted to lever within guide, k, the sweep bar, C, and the cord, B, all arranged substantially as shown and described and for the purpose specified.

74,446.—SASH STOP.—W. H. Sutherland, Seven Mile, Ohio.

I claim, 1st, The arrangement of the rack, l l, in Fig. 2, with inclined cogs in connection with an inclined tongue, z, in Fig. 3.

2d, The combination and arrangement of the locker, asscen at Fig. 3, viz., the eccentric, P P, with its pin, v, its arm, x, its square mortise, s s, and its groove for the reception of band, j, the band, j, with its slot, u v, and combination of said band with plate, w, the tongue, z, and its combination with arm, x, and plate, w, through mortise, y.

3d, The peculiar arrangement of the four-square section, r, of shaft, o o, in connection with its circular ends, as seen at Fig. 3.

74,447.—CORN HARVESTER.—J. B. Sweetland, Pontiac, Mich.

I claim, 1st, The lever, J, constructed as described and used in combination with the inclined platform and the wheel, I, and having a sickle knife on its lower end, substantially as represented.

3d, The hook, M, in combination with lever, J, and knife, L, as and for the purpose set forth.

3d, The concave bed, S, pivoted in the frame and used with the shield, K, and rack, T, as and for the purpose set forth.

4th, The rack, T, when used as and for the purpose specified.

74,448.—MACHINE FOR DISTRIBUTING GUANO, ETC.—John Franklin Thomas, Adamstown, Md.

I claim, 1st, The agitating apparatus above described consisting of pole, F, pins, f f1 f', and movable bottom, F", substantially as described.

2d, The combination of the agitating apparatus with the rod, k, lever, K, arm, L, arm of lever, M, and cam wheel, C, substantially as herein set forth.

3d, The combination of the arm, L, with the rod, N, eccentric shaft, O, and rod, P, substantially as herein shown and described.

74,449.—BELT COUPLING.—J. L. Thomas, Newburg, Ohio.

I claim the belt coupling constructed as described consisting of the rectangular metal band, a, formed in one piece having bevelled ends, the plate, b, provided with the projecting ends, c, working upon the bevelled ends within the band, a, and operated by the set screws, d, as herein described for the purpose specified.

74,450.—SLEIGH.—Bjarne Thompson, Chicago, Ill.

I claim connecting the body of the sleigh with the front or runners by means of the slots, a, and irons, d, constructed and operating substantially as specified.

74,451.—ANIMAL TRAP.—J. S. Thompson, Sycamore, Ill.

I claim an animal trap with a sinking platform, M, and revolving gate, c, secured by latches, J a, constructed and operating as described,

74,452.—APPARATUS FOR BOILING SAP AND OTHER LIQUIDS.—James S. Thompson, Lyndon, Vt,

I claim the arrangement of the chambers, B C and opening, O, in the furnace, A, and flue, F, the tube, t, short pipes, G, pan, P, passage, a, and right-angular damper, D, as herein described for the purpose specified.

74,453.—SODA WATER BOTTLE.—William W. Timmons (assignor to Almeth White), Rahway, N. J.

I claim. 1st. A separate chamber, D, attached to and forming part of a bottle or similar vessel for containing beverage fluids, substantially as shown and described, for the purpose of causing the contents of the said chamber to commingle with the outflowing contents of the bottle, all as set forth.

2d, A screw cap, a, or its equivalent, substantially as shown, and when used for closing a chamber, D, and attached to a beverage bottle, all as set forth.

3d, The flange, i, or its equivalent, substantially as shown and described and for the purpose specified in combination with the chamber, D, and stopper, B, all as set forih.

74,454.—STEAM GOVERNOR.—John Tremper, Wilmington, Del.

I claim, 1st. The combination of one or more sliding thimbles or sleeves, K, with the radial or guiding arms, E, springs, J, and balls, F, substantially as and for the purpose specified.

2d, The arrangement of the springs, J, within the balls, F, and their extensions, c, encircling the radial or guiding arms, E, essentially as shown and described.

3d. The auxiliary removable springs, l, for operation in combination with the balls, F, and surings, J, whereby the the velocity may be increased or decreased at pleasure, substantially as specified.

74,455.—WATER WHEEL.—J. C. Trullinger, Oswego, Oregon.

I claim, 1st, The buckets above described, each having the bridge, O, and the curves, L O N, and L M N, when constructed and applied to a water wheel, substantially in the manner and for the purpose set forth.

2d. Also, the hoop and hub, K, in combination with the water wheel, A, substantially as and for the purpose set forth.

3d, Also, the combination of the gates, C C, the guide plates, D D, the levers, G G, the ring, F, provided with bases, F', when the several parts are constructed and arranged in the manner and for the purposes specified.

4th, Also, the combination of the wheel, gates, C C, guide plates, D D, levers, G G, and cases, E E, all constructed substantially as and for the purposes indicated.

74,456.—FRUIT BASKET.—P. B. Viele, Rochester, N. Y.

I claim, 1st. In combination with the cross-pieces, A A', provided with the slitted strips, a a, as above described, the encircling band, d, to which the said strips are secured by eyeleting or sewing, the whole arranged as herein specified.

2d, Also, retaining the packed baskets one within another for, for storage and transportation, by means of the eyelets, or equivalent openings, c, in the bottom of the baskets, and the cord, f, passing through said openings, the whole as hereinabove set forth,

74,457.—WATCH.—Arthur Wadsworth, Newark, N. J., assignor to himself and Robert Schell, New York city.

I claim, 1st, A main-spring barrel, for watch and other time movements, in which the body is confined upon the outside by either one or both of its ends substantially as and for the purpose described.

2d, In combination with the above, a main-spring barrel, when the body and toothed head, with the latter confining the former upon its outside, are so secured together that the former can turn in the latter upon the breakage of the spring, substantially as and for the purpose specified.

74,458.—DECOY BIRD.—Nathaniel Wales, Boston, Mass.

I claim a decoy having wings hinged thereto, arranged to be operated by manipulation of a sportsman, substantially as and for the purpose described.

74,459.—WASHING MACHINE.—Josiah Webb, Spartansburg, Pa.

I claim, 1st, The combination of the crank-shaft, I, pitmen, H H, levers, F F, and corrugated blocks, E E, when used in connection with a box, A, having a corrugated bottom, D, in the manner and for the purpose specified.

2d, The combination of the step keys, L L, with the forked posts, K K, supporting the rod, G, and rendering the rubber blocks, E E, adjustable in hight, substantially as and for the purpose specified.

3d, The combination of the hinged blocks, E E, with the hooks, m m, and levers, F F, by which the blocks, E E, can be lifted out of the way when necessary, substantially in the manner described.

4th, The arm, M, for the purpose of holding the clothes in place while the rubbing blocks are passing over them, substantially as described.

74,460.—KNITTING MACHINE.—Jonathan C. Welsch, Edgerton, Ohio.

I claim, 1st, The ratchet wheel, S, the racks, T and U, arranged on the sliding frame, C, in combination with the eccentric stops for changing the needle operating cams, as set forth.

2d, The arrangement of the crank, D, with its shaft wheels, K L and M, and eccentric stops, N N, all constructed and operating in the manner and for the purpose set forth.

3d, The combination and arrangement of the bed, B, frame, C, crank, D, with its shaft, wheels, and cams, N N, ratchet, S, racks, T and U, latch openers, J J, dog, I, and yarn supporter, H, all constructed and operating as and for the purpose specified.

74,461.—RAILWAY FROG.—William Wharton, Jr., Philadelphia, Pa.

I claim the frog, D, having a shoulder against which the side of the main rail bears, and to which it is confined by bolts, e, or their equivalents, substantially as and for the purpose described.

74,462.—WAGON BRAKE.—Benj. F. Wheeler, Calais, Vt.

I claim, 1st, The movable handle of the brake, in combination with the slotted central reach metal loop and strap, B b, forward slotted rocker and the king bolt, and slotted rocker plate, substantially as described, for the purpose specified.

2d, In combination with the above, the sliding key, C c C, substantially as described, for the purpose specified.

3d, In combination with a wagon brake, the rag wheel, D, dog, E, and collet spring, F, substantially as described, for the purpose specified.

74,463.—PITMAN CONNECTION FOR HARVESTER.—Cyrenus Wheeler, Jr., Auburn, N. Y.

I claim, in combination with a crank or pitman-head that can turn on or around the pitman, a wrist-box that turns in said head by means of its curved surfaces, c c, moving against the concave bearings in the plates, b e, substantially as and for the purpose herein described.

74,464.—HARVESTER RAKE.—William N. Whiteley, Springfield, Ohio.

I claim, 1st, The rake head, R, provided with the arm, S, curved as described, and mounted in bearings on the swinging block, Q, and the pivot post, F, all constructed and combined as set forth and described.

2d, The combination of the rocking rake head, R, swinging block, Q, moving upon the pivot, G, gearing, i Y, shafting, W', and pulleys, V and U, all arranged on a two wheeled jointed bar machine, so as to move in unison with the cutter bar and platform, as set forth.

3d, The combination, in a single jointed harvesting machine, of the cutting apparatus, the reciprocating sweep rake, R, and the overhung horizontal reel, r, when said rake and reel are both mounted upon the inner shoe of said cutting apparatus, and constructed and operated in the manner shown and described.

4th, The rake head, R, with the arm, S, curved in the form shown and described, in combination with the stud, O, on the gear wheel, I, and block, Q, provided with the slot, P, to give a vibrating motion to said block, Q, and rake, R, as set forth and described.

5th, The tumbling shaft, W', in combination with the vibrating coupling arm, e, as and for the purpose set forth.

6th, The swinging block, Q, constructed with horizontal bearings for the rake, R, a slot, P, for the actuating stud, O, and pivoted upon a vertical axis, G, all as set forth and described.

7th, The arrangement of the arm S, arm L, block, Q, and guide frame, J, all constructed as described, and for the purpose set forth.

8th, The coupling arm, e, mounted upon the outer end of the main axle by means of the gimbal ring, y, and attached to the rear of the main frame by means of the arm, t, as and for the purpose set forth.

9th, The combination and arrangement of the plate, E, pivot post, F, gear wheel, I, block, Q, guide frame, J, and pinion, Y, when constructed as and for the purpose set forth.

10th, The arrangement of the driving pulley, v, the reel pulley, n, and tightening or guide pulley, u, so that the reel belt will form a triangle in passing around said pulleys, as and for the purpose set forth.

74,465.—HARVESTER RAKE.—William N. Whiteley and Jerome Fassler, Springfield, Ohio.

We claim, 1st, The pivoted brace, d, one of its ends moving on a center, which is coincident with the axis of the main pinion shaft, and its other end moving on the axis of the main driving wheel, as and for the purpose set forth.

2d, In combination with the guide frame, X, the guide switch, a', constructed to open automatically when released from its stop, e', and to be closed again by the passage of the traveller on the rake or reel arm next succeeding, substantially as and for the purpose described.

3d, In combination with the guide switch, a', pin, h', and the stop latch, e', constructed and operated substantially as described.

4th, In combination with the guide switch, a', and stop latch, e', the spiral spring, d', arranged as shown and described, so that the same spring acts against both the switch, a', and latch, e', as set forth.

5th, The rake head, o, constructed so that the upper ends of the shanks of the teeth are exposed, and provided with the curved rim or flange, s, as and for the purpose described.

6th, The adjustable guard, w, placed upon the rake head, substantially as shown and for the purpose set forth.

7th, The guard, y, placed upon the finger bar, substantially as and for the purpose set forth, in combination with the forked pitman, p, provided with conical or conoidal journals, as described, the spiral spring, c", for the purpose set forth.

8th, The seat slide, S, constructed with the offset, so that the seat may be placed over the center of the platform, or may be placed at one side of the same to counterbalance the weight of the rake, as set forth and described.

74,466.—GAGE FOR AUGERS.—W. E. Whiting, Providence, R. I.

I claim the tubes, A and C, in combination with the ring, D, and flange, E, when constructed and arranged substantially as set forth and for the purpose specified.

74,467.—CHURN.—C. B. Williams, Bourbon, Ind.

I claim the shaft, G, with its angular dashers, I I, and wings, H H, adjustable upon the shaft for gathering the the butter, when used within the box, F, as constructed and secured, and operating in the manner and for the purposes set forth.

74,468.—SELF-ACTING WAGON BRAKE.—J. A. Williams and W. W. Williams, Mattoon, Ill.

We claim the combination of the brake bar, b, the spring, g, the connecting rod, and chains, and the singletrees, p p, constructed, arranged, and operating as a self-acting wagon brake, substantially as herein described.

74,469.—STEAM HEATER FOR BREWERS AND OTHERS.—Thos. Williams and Joseph J. Yates, New York city. Antedated Jan. 31, 1868.

We claim, 1st, The heating apparatus consisting of the main pipe, B, and branch pipes, C, which are provided with self-closing valves, E, substantially as and for the purpose herein shown and described.

2d, The valve, E, when constructed as herein shown and described, so that by lengthening or shortening the stem, the amount of steam discharged during a given time may be increased or diminished at will.

3d, Providing the steam pipes of a heating apparatus with self closing valves, substantially as and for the purpose herein shown and described.

4th, The annular horizontal flange, K, when arranged around the lower part of the conical valve, D, substantially as herein shown and described.

74,470.—DRAFT EQUALIZER FOR DOUBLETREES.—M. V. B. Williamson, Jamesport, N. Y.

I claim, 1st, Hanging the pulley, B, forward of the doubletree, substantially as and for the purpose set forth.

2d, So constructing and attaching the arms or clevis, b, as to allow them and the pulley, B, to have free lateral vibratory motion from the bolt, a, as a center, substantially as hereinabove specified.

74,471.—DOUBLETREE.—M. V. B. Williamson, Jamesport, N. Y.

I claim the combination with a doubletree, A, of a short singletree or center bar, B, capable of swinging on its center, and attached to the doubletree by means of a clevis, or its equivalent, substantially as and for the purpose set forth.

Also the combination of the doubletree, A, with the singletree, B, substantially as set forth.

74,472.—STAGING FRAME.—Horace Wood, Leverett, Mass.

I claim, 1st. A staging frame composed of a series of frames, A, connected by planks or slats, d, and provided with windlasses, B, and cords or chains, e, all arranged substantially in the manner as and for the purpose set forth.

2d, The windlasses, D, applied to two or more frames, A, operated by the screw and worm-wheel gear, and provided with ropes, F, which pass through pulleys, k, attached to fixed ropes, l, substantially as and for the purpose specified.

74,473.—ROOFING SHOE.—James M. Wood, Lowville, N. Y.

I claim the combination of the perforated plates, A D E, when made in separate pieces and secured to the sole of the boot or shoe, in the manner and by the means herein described.

74,474.—PLOW.—William B. Young, Chicago, Ill.

I claim, 1st, The combination of the round, b, and rod, d, with or without either or all the rounds, a and c, and rod, e, substantially as described and for the purpose set forth.

2d, The combination of rounds, a b and c, and rods, d e and f, with the handles and beam of a plow, substantially as described and for the purpose set forth.

74,475.—PORTABLE ANIMAL TETHER.—Andrew Ralston, West Middletown, Pa.

I claim, 1st, A portable stock-feeding hitching frame consisting of upright posts, A A', mounted upon carriages and provided with a hitching rope or chain, E, and also with means for keeping this rope or chain under proper tension, substantially as described.

2d, In combination with uprights, A A', and a hitching rope or chain, E, a swivel frame, G, and a loaded tether, h i, substantially as described.

REISSUES.

2,858.—LATH MACHINE.—Jonathan C. Brown, Brooklyn, N. Y., assignee of Henry C. Smith, Dated Sept. 28, 1852. Extended seven years.

I claim, 1st, Turning the log to be cut by driving the mandrels at each end thereof by gearing them directly with the driving shaft, substantially as and for the purposes set forth.

2d, The dog, A, and its appurtenances for connecting the log with the mandrels and disconnecting it therefrom, as specified.

3d, The combination of the cylinder cutter, K, and the stripping knife moved up simultaneously and automatically, all substantially as and for the purposes set forth.

2,859.—TOBACCO PIPE.—Gustav Lautenschlager, Cincinnati, Ohio, and George L. Gott, New York city. Dated Jan. 30, 1866. Antedated Jan. 17, 1866.

We claim a bowl of a nicotine receptacle of a tobacco pipe made of coal dust mixed with pitch or other suitable cement, and formed substantially as and for the purposes described.

2,860.—INDEX DOOR PLATE.—E. M. Montague, Boston, assignee of Nathan Ames, Saugus Centre, Mass. Dated July 31, 1860.

I claim, 1st, The use in a door plate of a tablet or slate and an adjustable plate or disk having figures or readable signs or characters, for the purposes specified and set forth.

2d, In combination with the above door plate and rotating disk, C, marked with the hours and parts of an hour, as shown in Fig. 2, said disk being confined in the center to a spindle, D, which passes through the door, substantially as and for the purpose described.

3d, The spring, S, arranged, combined and operating substantially as described.

2,861.—LANTERN.—Francis Morandi, Boston, Mass. Dated Feb. 5, 1856.

I claim the funnel, D, applied to the lantern, in the manner and for the purpose substantially as herein set forth.

2,862.—SLEEPING CAR.—George M. Pullman, Chicago, Ill., for himself and assignee of Ben Field, Albion, N. Y. Dated Sept. 19, 1865.

We claim, 1st, The construction and arrangement of the berth, A, hinged to the car at B, and supported by the jointed suspenders, C, or other analogous devices, the whole so adapted to the car that it forms a recess to receive the same when turned up, substantially as described.

2d, In combination with the berth, A, the sliding partition, I, substantially as described.

3d, In combination with the berth, A, the movable head board, J, substantially as described.

4th, The construction and arrangement of a car seat with the back and seat cushions hinged together and disconnected from the seat frame so that the back cushion may be placed on the seat frame and the seat cushion extended to meet the seat cushion of the opposite chair, substantially as described.

2,863.—SEED PLANTER.—Adam R. Reese, Phillipsburg, N. J., assignee of George W. Lee. Patented November 21, 1854.

I claim, 1st, The cast iron ends of the seed box of a grain drill, provided with flanges formed thereon, fitting and supporting the ends of the front and rear boards, and with legs or feet for supporting the box on the main frame, as described.

2d, The scores, o o, or their equivalent, at the extremities of the holes, c, in the disks, M, in combination with the gradual narrowing of the holes towards their extremities, so as to save the grain from being cut, substantially as described.

2,864.—SEEDING MACHINE.—Adam R. Reese, Phillipsburg, N. J., assignee of George W. Lee and Adam R. Reese. Patented January 15, 1861.

I claim, 1st, The lifter handle that raises the seed tubes out of the ground, in combination with a mechanism or device that throws the feed out of gear, before the seed tubes are out of the ground, by the one movement of said lifter handle.

2d, In combination with a grain drill tube and draw bar, a brace to support the tube, fastened at its lower end to the tube, and at its upper end embracing the draw bar, and a wooden pin, which holds the upper end in proper position, and which will allow the brace to slide back on the bar when the tube strikes an obstruction, for the purpose set forth.

3d, The feed slide of a grain drill made of two bars, the one sliding in recesses of the grain stirrups, while the other is adjustable in relation thereto, in such manner as to maintain the parallelism of said bars, for the purpose set forth.

2,865.—SCHOOL DESK AND SEAT.—Calvin W. Sherwood, Chicago, Ill. Patented November 6, 1865. Division A.

I claim, 1st, The joint, c composed of the nave, C', and axle, B', constructed and operating substantially as set forth.

2d, The arrangement and combination of the arms, C, nave, C', and axle, B', with the seat, D, and standard, A, substantially as specified.

3d, The double acting stop, k, constructed and operating substantially as specified.

4th, So locating and arranging the stop, k, and axle, B', on he head, B, that, with the nave, C', a covered and compact joint is provided, substantially as and for the purposes specified.

5th, The double acting stop, k, in combination with the shoulder, l, operating in the slot or space, substantially as specified.

2,866.—SCHOOL DESK AND SEAT.—Calvin W. Sherwood, Chicago, Ill. Dated Nov. 6, 1866. Div. B.

I claim, 1st, The jointed braces, F, when provided with lips, a, and ledges, b, substantially as and for the purposes specified.

2d, The combination and arrangement of the ledges, b, lips, a, and pins, d, with the braces, F, and hinged shelf, K, substantially as specified.

3d, The arrangement and combination of the hinged arms H, jointed braces F, and hinged arms G, with the standards, A, and desk top, I J, substantially as and for the purposes specified.

2,867.—SELF MOUSING HOOK.—The Middletown Wool Company, Middletown, Ct., assignees by mesne assignments of J. R. Henshaw. Dated Oct, 26, 1858. Reissue 2,166 dated Feb. 6, 1866.

I claim the combination and arrangement of the hooks proper, eye, spring bar, spring, and checks to protect the spring, substantially as before set forth.

2,868.—CRANK PIN AND BOX FOR HARVESTER.—Thomas Welch, Churchville, N. Y. Dated Aug. 1, 1865.

I claim, 1st, The crank pin box of a harvester, with an oil reservoir, G, for the purpose set forth.

2d, A crank pin box or head, D H, of a harvester, so constructed with reference to the crank pin, C, that the outer end of said pin will be enveloped by the head, D H, for the purposes set forth.

3d, In combination with a crank pin box, provided with an oil reservoir, a screw cap, G, or its equivalent, for the purpose of allowing the reservoir to be filled with, and prevent the escape of unnecessary oil therefrom.

4th, The pitman, E, and knife head, F, connected by the taper screw head, g, and socket, f, or their equivalents, and the bolt which passes into or through the parts, as set forth.

5th, In combination with the connecting parts, g f, and bolt, as specified, a washer, in the manner and for the purposes set forth.

DESIGNS.

2,929.—TRADE MARK.—J. H. Armbruster, Philadelphia, Pa.

2,930.—GLASS BOTTLE.—Neail N. Brown, Philadelphia, Pa.

2,931.—TRADE MARK.—Sampson Hainemann, Simon Hainemann, and David Steiner, New York city.

2,932.—PRINTERS' BORDER.—Wm. H. Page (assignor to Wm. H. Page & Co.), Norwich, Ct.

2,933.—SKATE RUNNER.—Abel C. Tallman, Philadelphia, Pa.

2,934.—TRADE MARK.—Willis C. Walker, St. Louis, Mo.

NOTE.—SIXTY-NINE patents in the above list were solicited through the office of this paper.—[EDS.

PENDING APPLICATIONS FOR REISSUES.

Application has been made to the Commissioner of Patents for the Reissue of the following Patents, with new claims as subjoined. Parties who desire to oppose the grant of any of these reissues should immediately address MUNN & Co., 37 *Park Row, N. Y.*

55,979.—HAY RAKER AND LOADER.—Horace Baker, Cortland, N. Y. Dated July 3, 1866. Application for reissue received and filed Dec. 26, 1867.

1st. I claim the two positively actuated endless aprons revolving in opposite directions in combination with the toothed wheels, E2, or their equivalents, upon the shafts, I and L, and so placed relatively that the hay may be picked up and directed between said aprons and by them elevated, substantially as and for the purpose set forth.

2d, I claim the standards, T T, when so constructed that by their elasticity they shall maintain the upper portions of said aprons face to face and permit variations in the quantity of hay carried between them, as set forth.

3d, In combination with said endless aprons I claim the guide, S2, so constructed as to pass the hay over the forward apron and on to the wagon.

4th, In combination with said endless aprons, I claim the spur wheels, F and H, and the shaft, I, operating in the slot, I', and so constructed as to allow of a forward and backward movement of such shaft (and forward apron by such shaft), substantially as and for the purpose set forth.

5th, I claim the driving wheel, B, and cup-shaped wheel, C, constructed as described in combination with the spur wheels, F H and K, substantially as and for the purpose set forth.

72,905.—ATTACHING ORNAMENTAL HEADS TO NAILS, SCREWS, ETC.—Thomas C. Richards, New York city. Dated Dec. 31, 1867. Application for reissue received and filed Feb. 1, 1868.

I claim the attaching of ornamental heads to nails and screws by means of a recess or groove formed on or attached to the inner side of the ornamental head to receive the head proper of the nail or screw, substantially as shown and described.

25,635.—ACCOUNTANT LABELS FOR PERIODICALS, ETC.—Robert Dick, Buffalo, N. Y. Dated Oct. 4, 1859. Antedated July 26, 1858. Reissue No. 1,679. Dated May 31, 1864. Application for reissue received and filed Feb. 3, 1868. Div, A,

1st. I claim keeping accounts current in a standing form or forms of type, or their equivalents, by the method of type posting, substantially as set forth.

2d, I claim a ledger or record composed of impressions taken from said form or forms, substantially as set forth.

3d, I claim the use of all such impressions for rendering or transmitting accounts or for addressing or directing newspapers or other periodicals to subscribers or others whether applied to the papers directly from the type or intermediately from impressions previously taken or otherwise, substantially as herein described.

25,635.—ACCOUNTANT LABELS FOR PERIODICALS, ETC.—Robert Dick, Buffalo, N. Y. Dated Oct 4, 1859. Antedated July 26, 1858. Reissue No. 1,679. Dated May 31, 1864. Application for reissue received and filed Feb. 3, 1868. Div B.

1st, I claim a combined cutter and platen, operating as and for the purpose set forth.

2d, A feeding mechanism as described, or its equivalent, for advancing the web of names in combination with the cutter platen, substantially as set forth.

3d. The described or equivalent mechanism for coating the web with an adhesive mixture substantially as set forth.

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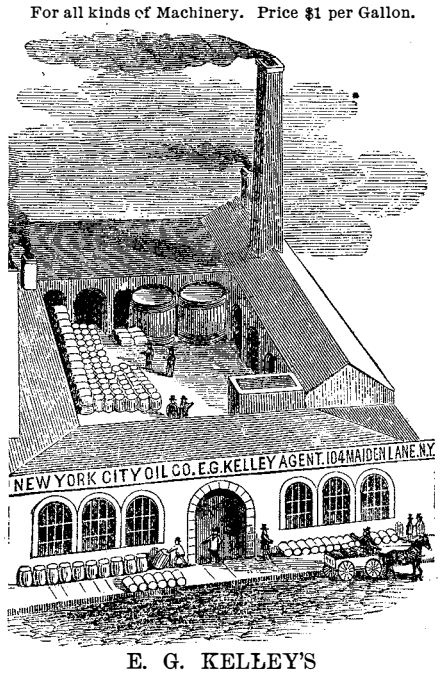

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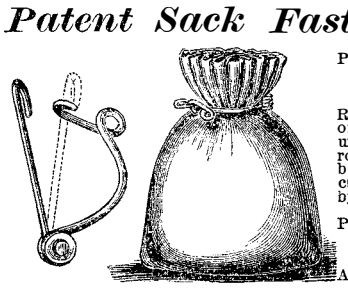

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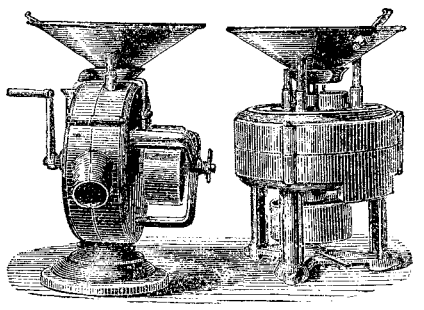

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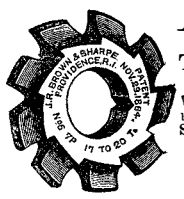

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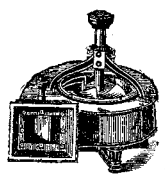

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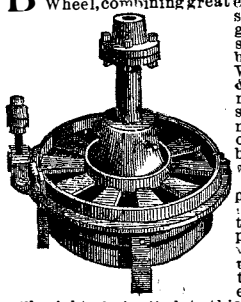

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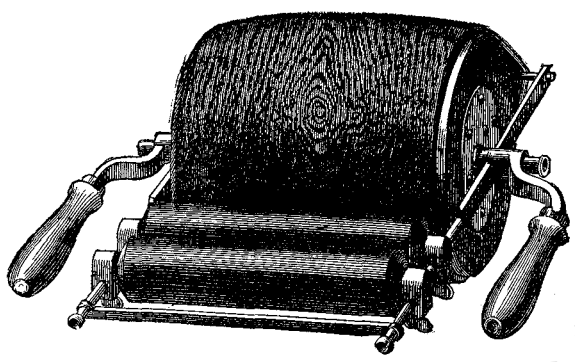

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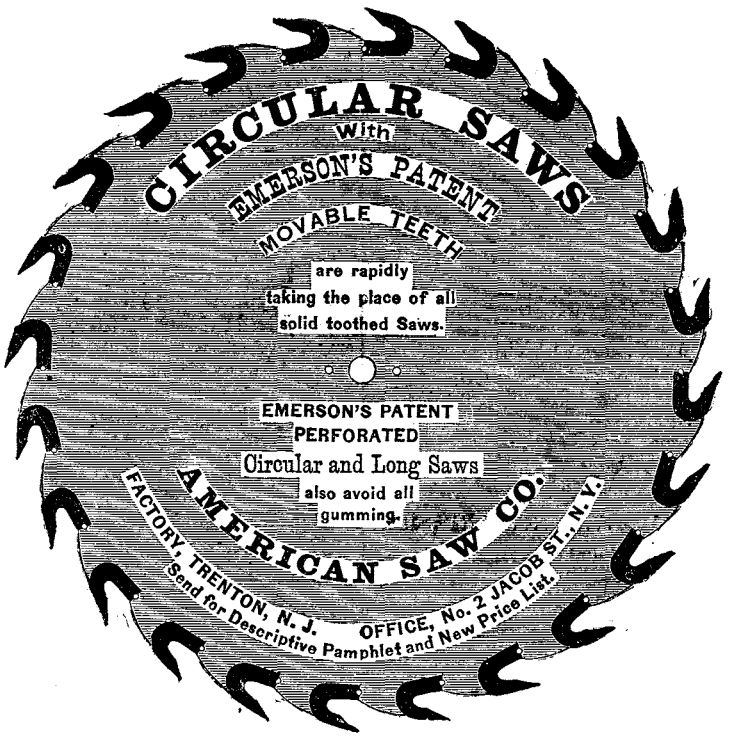

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